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# Crucible and Electric Tool Steel

## Some Aspects of Choice in Their Manufacture—Electric Furnace a Sealed Crucible—Operating Conditions Compared in Detail

BY W. J. AND S. STUART GREEN*

PROBABLY one of the questions most frequently propounded has been—"is electric steel really as good as crucible"? Our answer has been in some cases yes and others probably no. Electric steel, using certain materials and melting practice, may be no better than open-hearth or Bessemer steel and, on the other hand, using other materials and melting practice, it may easily be the equal of the finest steel made.

Be this as it may, the basic electric furnace has established itself as a formidable competitor of the time-honored crucible wherever tool steel is made, and it seems opportune to review in a brief some thoughts gathered in a rather long crucible, though a necessarily shorter, electric experience. This experience covers the manufacture of almost every variety of alloy tool steels by both processes, including a large tonnage of high-speed steel made in 3- and 6-ton heats in the electric furnace and, last but not least, a large tonnage of straight carbon tool steel, which for the purpose of this paper is probably the most important; for it is in the manufacture of this steel, unclouded by alloys, that a true comparison can best be made.

The motive for writing the paper is a disinterested one, for we have no furnace to sell nor have we one to recommend. The choice of a melting medium for the manufacture of tool steels is now confronting some manufacturers of this commodity and, if these notes assist in the proper selection, the purpose of this paper will be fully served. To those who already have made a selection or are not, for other reasons, confronted by such a choice but are tool steel makers, this article may be of interest merely as a presentation of conclusions drawn from an intimate contact with both furnaces in contrast to the more or less inspired claims of furnace builders.

### The Crucible for Steel Castings

The subject, tool steel manufacture, probably does not rightly include steel castings. This branch has, however, some small bearing on the purpose of the paper and therefore the following brief mention is made.

It has fallen to the lot of both of the writers to have had experience with the delivery of crucible steel for castings, and the passing therefore of the crucible in this branch of the steel trade seems something of a personal loss. That it is passing there can be no longer reasonable doubt; the following figures clearly show the trend and demonstrate also that the electric furnace, while not necessarily the cause, has secured all the high-grade tonnage so relinquished:

In the United States only 1729 tons of crucible steel castings were made in 1920, as against 20,550 tons of crucible steel castings in 1912, a falling off of almost 92 per cent; indeed in 1919 the situation was even worse, when only 1009 tons of crucible steel castings was made, a falling off of something like 95 per cent, which of course means approximate extinction. In 1920 the electric furnace made in the United States 155,196 tons of steel castings, thereby surpassing the largest crucible tonnage ever made.

These figures are taken from the statistics of the American Iron and Steel Institute and were published by the writers in graphic form in an article appearing in THE IRON AGE, Oct. 27, 1921. They would seem to furnish reliable indication of the rejection in America, in no uncertain fashion, of the crucible for the manufacture of steel castings. We regret our inability to secure accurate figures covering the production of steel castings in Great Britain, but those we have seem to indicate a similar, though by no means so drastic a, condition.

It appears therefore that in the manufacture of steel castings the crucible has already very largely given way to the electric furnace, which latter has incidentally secured additional tonnage elsewhere. There can be no question in face of these figures, representing as they do so strong an adoption of the electric furnace, of the satisfactory quality of electric steel for this purpose. Indeed, the writers can see one or two possible advantages in favor of the electric steel, totally aside from the strong economic reasons, which latter undoubtedly have played so large a part in its adoption. These reasons will be more fully touched in connection with tool steel production.

### The Crucible and Tool Steel

The very much weakened position of the crucible in the steel casting industry is not exactly the condition to-day existing in the tool steel branch, in which the crucible still retains much of its old time dominance, particularly in Sheffield. The reasons for this are possibly to be found in the following. The steel casting industry, by reason of smaller commercial outlay requirements, became very much more competitive than the tool steel branch, with its necessarily costly hammers, rolling mills, etc. Competition suggested cheaper steel-making methods and these were tried. The converter and the open-hearth secured a portion of the cheaper work but did not succeed to the high grade end in spite of the somewhat easier quality requirements of castings as against tool steel. The electric furnace, however, could produce cheaper steel than the crucible by virtue of its greater efficiency and its quality proved to be fully satisfactory, as has been shown before. A deluge of work was diverted to the electric furnace and

*Pittsburgh.

# Current Metal Prices

**On Small Lots, Delivered from Merchants' Stocks, New York City**

The following quotations are made by New York City warehouses.

As there are many consumers whose requirements are not sufficiently heavy to warrant their placing orders with manufacturers for shipment in carload lots from mills, these prices are given for their convenience.

On a number of articles the base price only is given, it being impossible to name every size.

The wholesale prices at which large lots are sold by manufacturers for direct shipment from mills are given in the market reports appearing in a preceding part of THE IRON AGE under the general heading of "Iron and Steel Markets" and "Non-ferrous Metals."

### Iron and Soft Steel Bars and Shapes

| | Per Lb. |
|---|---|
| Bars: | |
| Refined bars, base price | 2.53c. |
| Swedish bars, base price | 10.00c. |
| Soft steel bars, base price | 2.53c. |
| Hoops, base price | 3.38c. |
| Bands, base price | 3.13c. |
| Beams and channels, angles and tees 3 in. x ¼ in. and larger, base | 2.63c. |
| Channels, angles and tees under 3 in. x ¼ in., base | 2.53c. |

### Merchant Steel

| | Per Lb. |
|---|---|
| Tire, 1½ x ½ in. and larger | 2.50c. |
| (Smooth finish, 1 to 2½ x ¼ in. and larger) | 2.70c. |
| Toe calk, ½ x ⅝ in. and larger | 3.20c. |
| Cold-rolled strip, soft and quarter hard | 6.25c. to 7.25c. |
| Open-hearth spring steel | 3.55c. to 6c. |
| Shafting and Screw Stock: | |
| Rounds | 3.45c. |
| Squares, flats and hex. | 3.95c. |
| Standard cast steel, base price | 12.00c. |
| Extra cast steel | 17.00c. |
| Special cast steel | 22.00c. |

### Tank Plates—Steel

| | |
|---|---|
| ¼ in. and heavier | 2.63c. |

### Sheets

*Blue Annealed*

| | Per Lb. |
|---|---|
| No. 10 | 3.28c. to 3.53c. |
| No. 12 | 3.33c. to 3.58c. |
| No. 14 | 3.38c. to 3.63c. |
| No. 16 | 3.48c. to 3.73c. |

*Box Annealed—Black*

| | Soft Steel C. R., One Pass Per Lb. | Blued Stove Pipe Sheet, Per Lb. |
|---|---|---|
| Nos. 18 to 20 | 3.80c. | ..... |
| Nos. 22 and 24 | 3.85c. | 4.10c. |
| No. 26 | 3.90c. | 4.15c. |
| No. 28 | 4.00c. | 4.25c. |
| No. 30 | 4.25c. | ..... |

No. 28 and lighter, 36 in. wide, 10c. higher.

*Galvanized*

| | Per Lb. |
|---|---|
| No. 14 | 3.95c. to 4.10c. |
| No. 16 | 4.10c. to 4.25c. |
| Nos. 18 and 20 | 4.25c. to 4.40c. |
| Nos. 22 and 24 | 4.40c. to 4.55c. |
| No. 26 | 4.55c. to 4.70c. |
| No. 27 | 4.70c. to 4.85c. |
| No. 28 | 4.85c. to 5.00c. |
| No. 30 | 5.35c. to 5.50c. |

No. 28 and lighter, 36 in. wide, 20c. higher.

### Welded Pipe

| *Standard Steel* | Black | Galv. | *Wrought Iron* | Black | Galv. |
|---|---|---|---|---|---|
| ½ in. Butt... | —56 | —40 | ¾-in. Butt... | —30 | —13 |
| ¾ in. Butt... | —61 | —47 | 1½-in. Butt.. | —32 | —15 |
| 1-3 in. Butt.. | —63 | —49 | 2-in. Lap..... | —27 | —10 |
| 3½-6 in. Lap. | —60 | —46 | 2½-6-in. Lap. | —30 | —15 |
| 7-8 in. Lap... | —56 | —34 | 7-12-in. Lap.. | —23 | — 7 |
| 9-12 in. Lap.. | —55 | —33 | | | |

### Steel Wire

| BASED PRICE* ON No. 9 GAGE AND COARSER | Per Lb. |
|---|---|
| Bright basic | 3.75c. |
| Annealed soft | 3.75c. |
| Galvanized annealed | 4.50c. |
| Coppered basic | 4.25c. |
| Tinned soft Bessemer | 5.75c. |

*Regular extras for lighter gage.

### Brass Sheet, Rod, Tube and Wire

BASE PRICE

| | |
|---|---|
| High brass sheet | 17¼c. to 17½c. |
| High brass wire | 17¼c. to 17½c. |
| Brass rod | 14¾c. to 15 c. |
| Brass tube, brazed | 26 c. to 27½c. |
| Brass tube, seamless | 18½c. to 19 c. |
| Copper tube, seamless | 21¼c. |

### Copper Sheets

Sheet copper, hot rolled, 24 oz., 21½c. per lb. base.

Cold rolled, 14 oz. and heavier, 2c. per lb. advance over hot rolled.

### Tin Plates

| Bright Tin | | Coke—14-20 | | |
|---|---|---|---|---|
| | Grade "AAA" Charcoal 14x20 | Grade "A" Charcoal 14x20 | | Primes | Wasters |
| | | | 80 lb.... | $6.05 | $5.80 |
| | | | 90 lb.... | 6.15 | 5.90 |
| | | | 100 lb.... | 6.25 | 6.00 |
| IC.. | $10.00 | $8.50 | IC... | 6.40 | 6.15 |
| IX.. | 11.25 | 10.00 | IX... | 7.40 | 7.15 |
| IXX.. | 13.00 | 11.50 | IXX... | 8.40 | 8.15 |
| IXXX.. | 14.75 | 13.25 | IXXX... | 9.40 | 9.15 |
| IXXXX.. | 16.25 | 15.00 | IXXXX... | 10.40 | 10.15 |

### Terne Plates

8-lb. Coating 14 x 20

| | |
|---|---|
| 100 lb. | $7.00 |
| IC | 7.25 |
| IX | 7.50 |
| Fire door stock | 10.00 |

### Tin

| | |
|---|---|
| Straits, pig | 35c. |
| Bar | 40c. to 45c. |

### Copper

| | |
|---|---|
| Lake ingot | 16 c. |
| Electrolytic | 15¾c. |
| Casting | 15¼c. |

### Spelter and Sheet Zinc

| | |
|---|---|
| Western spelter | 6½c. to 7c. |
| Sheet zinc, No. 9 base, casks | 10½c. open 11c. |

### Lead and Solder*

| | |
|---|---|
| American pig lead | 5¾c. to 6¼c. |
| Bar lead | 6¾c. to 7 c. |
| Solder, ½ and ½ guaranteed | 27c. |
| No. 1 solder | 25c. |
| Refined solder | 21c. |

*Prices of solder indicated by private brand vary according to composition.

### Babbitt Metal

| | |
|---|---|
| Best grade, per lb | 80c. |
| Commercial grade, per lb | 40c. |
| Grade D, per lb | 35c. |

### Antimony

| | |
|---|---|
| Asiatic | 6½c. to 6¾c. |

### Aluminum

| | |
|---|---|
| No. 1 aluminum (guaranteed over 99 per cent pure), in ingots for remelting, per lb | 27c. to 29c. |

### Old Metals

Prices are generally unchanged, although business is very quiet. Dealers' buying prices are nominally as follows:

| | Cents Per Lb. |
|---|---|
| Copper, heavy crucible | 11.25 |
| Copper, heavy wire | 10.75 |
| Copper, light and bottoms | 8.25 |
| Brass, heavy | 5.50 |
| Brass, light | 4.50 |
| Heavy machine composition | 8.00 |
| No. 1 yellow brass turnings | 5.50 |
| No. 1 red brass or composition turnings | 7.25 |
| Lead, heavy | 3.75 |
| Lead, tea | 2.50 |
| Zinc | 2.50 |

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The motive for writing the paper is a disinterested one, for we have no furnace to sell nor have we one to recommend. The choice of a melting medium for the manufacture of tool steels is now confronting some manufacturers of this commodity and, if these notes assist in the proper selection, the purpose of this paper will be fully served. To those who already have made a selection or are not, for other reasons, confronted by such a choice but are tool steel makers, this article may be of interest merely as a presentation of conclusions drawn from an intimate contact with both furnaces in contrast to the more or less inspired claims of furnace builders.

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The very much weakened position of the crucible in the steel casting industry is not exactly the condition to-day existing in the tool steel branch, in which the crucible still retains much of its old time dominance, particularly in Sheffield. The reasons for this are possibly to be found in the following. The steel casting industry, by reason of smaller commercial outlay requirements, became very much more competitive than the tool steel branch, with its necessarily costly hammers, rolling mills, etc. Competition suggested cheaper steel-making methods and these were tried. The converter and the open-hearth secured a portion of the cheaper work but did not succeed to the high grade end in spite of the somewhat easier quality requirements of castings as against tool steel. The electric furnace, however, could produce cheaper steel than the crucible by virtue of its greater efficiency and its quality proved to be fully satisfactory, as has been shown before. A deluge of work was diverted to the electric furnace and

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to-day opinion is general that its product is fully satisfactory for the most exacting casting.

While this seems to have been generally agreed upon so far as castings are concerned, a similar light of inquiry is now, for reasons not very different, being turned on tool steel production by its manufacturers. The inquiry seems to be somewhat along the following lines: "Is well made electric tool steel fully the equal of crucible tool steel, and if so, what economic advantages does the electric furnace possess?" No direct answer is attempted by the writers to this question, though their opinion will be readily gathered. Before opinions are offered, however, the following figures representing, as they do, facts, might be wholesome. They indicate a growing confidence, the world over, in electric steel. The figures represent castings and ingots combined.

*Table of Electric Steel Output in Tons*

| Year | All Countries | United States | Great Britain |
|---|---|---|---|
| 1913 ..... | 182,919 | 30,180 | ..... |
| 1915 ..... | 302,430 | 69,412 | 22,354 |
| 1916 ..... | 559,687 | 168,918 | 50,049 |
| 1917 ..... | 846,267 | 304,543 | 122,542 |
| 1918 ..... | 1,176,073 | 511,364 | 150,304 |

### The Age of Crucible Steel

The fact that crucible steel is now within two decades of its second century of birthdays is one without precedent. Indeed there is no other type of furnace whose life is even half that of the Huntsman process. This of course, is intended to cover commercial production only and not the weak speculative production of laboratory quantities in India and elsewhere, and it also refers to the production of liquid steel. Cast steel became synonymous for crucible steel and exists as a trade term to some extent to-day though the march of progress has rendered this term now almost obsolete, Bessemer steel being every bit as much entitled to the term as is crucible. The uninformed buyer, however, still specifies "Warranted Cast Steel" and has no doubts as to what he wants and is of course supplied with crucible steel.

Such remarkable longevity of a steel-making process must have a reason or reasons to keep it in so important a position for so great a number of years. Was the reason a steel-making monopoly? Undoubtedly for more than half its existence it did enjoy such a fortunate position. This monopoly played a tremendous part in its development, an enormous advantage enjoyed by no subsequent steel-making process. Articles of commerce were made from crucible steel solely by virtue of its monopoly, such as shovels, locomotive tires, etc., but this class of trade it lost with the birth of the new and cheaper steel-making methods. Among other monopolies it, of course, had the tool steel trade, and it is only in very recent years, with the birth of the electric furnace, that this monopoly has been really questioned.

If the crucible is to-day holding a large part of the tool steel trade solely by virtue of a monopoly, it has now a very precarious hold indeed, for the last 10 years have brought forward a vigorous competitor. But it cannot be doubted that this monopoly of more than 100 years does account for a fair portion of the trade it enjoys to-day.

With the monopoly of crucible steel seriously threatened there can be no question that, did the crucible possess any commercial advantages over its new competitor, it would still continue to hold its very important position in the industry. This, however, it does not; indeed, it cannot claim equality. Its competitor is the most economic steel-melting medium yet known in the utilization of fuel energy, while the crucible is probably the most wasteful. The labor cost per ton of steel is also an important commercial factor in which the crucible must give way to the electric furnace. It is not opportune in an article of this sort to exhaustively discuss this last question and it is therefore left, though its importance should not be overlooked.

### Is Crucible Steel Peerless

Is crucible steel a peerless steel? If it is, then its place in the industry is secure, its wastefulness of operation is adequately neutralized, its monopoly assured. This is unquestionably the keystone of the whole position. If crucible steel cannot be duplicated in quality by any known melting medium, its preeminence cannot be assailed, neither will its markets be without profit. The question has therefore resolved itself to one of quality. We have seen that if equality of product is shared with the electric furnace, the crucible must bow to its more efficient competitor, possessing such strong commercial advantages. The passing of the crucible, as the leader of fine steel production, is therefore a strong probability, if the electric furnace can regularly and with ease produce a steel the equal of the crucible.

The views of two practical steel makers, who have worked both furnaces, may therefore be of some interest in reviewing this important question. The determination of quality is one of many phases and the writers intend to deal only with those strictly within their experience. Lathe tests, microscopical tests and other physical tests, that are of value in defining quality will not be attempted. It has long been the writer's conviction, however, that analysis alone means little indeed as an indicator of quality. The particular phase they wish to more urgently deal with being the features of melting practice in both cases which have been found to add body or, on the contrary, weaken the steel in question. The discussion therefore will be limited to the question of melting practice in so far as it affects quality, with some survey of the abilities of each method of melting to admit such practice.

### Difference in Quality Limited to Furnace Practice

Inasmuch as all ingots, whether they be crucible or electric steel, can be accorded exactly the same treatment in the working to commercial sizes, it is patent that any differences of quality can be limited to the production of liquid steel and the casting thereof. This, if admitted, simplifies very much the problem. It can be at once agreed that all electric steel, if running in competition with crucible steel, shall be accorded exactly the same care, treatment and advantages in the working down to the finished bar as is crucible steel.

A survey of the subject will show that any differences between the quality of crucible steel and electric steel must occur in the liquid steel or the casting, and not introduced thereafter. The steel maker, not the hammer man or the roller, is therefore the only operative who can in any way be held responsible for difference in the quality of the two steels, outside of those differences imposed by the nature of the furnaces themselves.

The steel maker can influence the quality of his product in two ways: First, in the selection of his melting stock, and second, in his melting and casting practice. As casting practice, both crucible and electric, is distinctly capable of duplication and is duplicated daily in many large plants, a very large percentage of crucible steel being ladle cast and a large amount of electric tool steel being cast in small ingots about 4 in. square and up, it must be apparent that any difference in quality cannot arise from that source and can therefore be well left out of these considerations.

It would seem therefore reasonably certain that any differences that might exist in the qualities of crucible and electric tool steel must be introduced in the following places only:

I.—In the selection of melting stock.
II.—In the melting practice employed.

III.—Inherent differences imposed by the furnace employed, crucible or electric.

Having narrowed the question to the three points enumerated above, the subject can be carefully looked into with a degree of accuracy and the deductions checked against known facts where required.

The three subjects, for more careful discussion, are not arranged with any idea of order of importance, as any one of them could be vital to the success of either process. It will be seen also that no great attempt is made to investigate "mysterious virtues," sometimes even in this day, advanced in favor of the crucible, for it seems to us that while such things might well have passed muster a century ago, it is extremely questionable to-day, for the mysterious is very frequently illusionary.

## I. Selection of Melting Stock

The selection of melting stock, or raw materials, is a very serious responsibility, and it is noteworthy that from the early history of the crucible its melters used great discrimination, amounting to almost a fetish in such selection. The crucible held out no glamor of chemical refining, no illusionary manufacture of silk from the proverbial sow's ear, and they were therefore not distracted from the straight and narrow path. Only what is put in the "weigh-pan" will be found in the steel was the dominating thought and guided them safely in the direction of the best steel-making Swedish irons, blister bar, Swedish white irons and, of course, its own tool scrap. The fact that this industry was enjoying a most complete monopoly largely assisted in such a choice, admitting the free use of somewhat expensive materials, having no keen competition to fight, nor a possibility of being supplanted by any less costly method, since it was the only steel-making process in existence.

### Raw Material Costs

The crucible therefore started out with the slogan, "it takes quality to make quality." This slogan we have suggested was possibly inspired by its complete monopoly of the entire industry, and to the fact that no "red herring" in the shape of refining possibilities had to be drawn across its track. It used the best possible materials for its first quality product (we are concerned in this paper with no other) and, to a large degree, has to-day retained with remarkable fidelity this foundation of quality. Chemical guidance at the inception of this industry was entirely non-existant and its absence created brands of steel-making irons, some attaining wonderful reputations.

Many fine old brands come to our minds of the Dannemora type and, it might be said here, that soon two distinct qualities of Swedish irons were to be bought, Lancash and Walloon. These two irons, though chemically substantially identical, varied very much in price. Looking over some old records, we find Walloon iron costing as much as 28s. per hundred weight, while Lancash was as low as 9s. 6d. per hundred weight. Cost of manufacture appears to be largely responsible for this, the Walloon process being much more expensive in so far as fuel was concerned, the fuel being, of course, charcoal. Typical of quality, brought to bear on the production of first quality crucible steel, the Walloon iron, in spite of the chemical similarity of Lancash and in the face of its very much higher price, was very freely used in the manufacture of "warranted best cast steel" by the Sheffield crucible steel makers. Swedish white carburizing irons held sway over gray irons, and so, all through the selection.

The costly nature of these melting materials is emphasized by the necessity of reducing to pot size by hammer, mill and shear, all this material, but, for the excellent reason before stated, the trade was then well able to bear this further great expenditure. The situation is now changed by the arrival of its competitor, which does not require such an expenditure, in fact prefers larger stock for its reduced surface advantage. The fine brands of steel-making irons became standards from which no departures were made; materials were blended into private mixtures and these surrounded with a certain amount of secrecy, which very probably offers full explanation for such intangible claims of "mysterious virtues." These private brands certainly did much, however, to build up individual reputations, which have been very jealously guarded, in some cases for more than a century.

It will be seen that, in so far as the selection of raw materials was concerned, the crucible used only the best obtainable without regard to price. It faithfully and consistently maintained high standards and, with a few notable exceptions, does so to-day. On such a foundation, with 180 years of connection and 120 years absolute monopoly, it is not hard to see some reason for the tenacity of its hold on the tool steel business. It is well indeed to turn on the light of inquiry and see how far these things hold to-day.

### Raw Materials for the Electric Furnace

Turning to the electric furnace, it is at once apparent that exact duplication of the melting stocks of the crucible is easily possible by the simple expedient of charging exactly the same materials. It is evident therefore that the electric furnace need take no second place in the question of native purity and natural body of melting stock.

It must be admitted, however, that in the early days of the electric furnace this duplication was not attempted, it not being born with a silver spoon in its mouth as was its venerable competitor. It was not born and raised under the kindly wing of monopoly, as was its rival, neither did it hold the powerful connection such as is carried by any institution almost 200 years old. What was worse, it had from its inception doubtful claims of remarkable refining properties, making possible the manufacture of the finest tool steel from any old kind of scrap, so long as it was steel. These claims, inspired no doubt by the spur of keen competition and the apparent necessity of finding some striking advantage to recommend its adoption and the consequent scrapping of the crucible, did incalculable harm at the outset. No particular attention was deemed necessary, or given to the selection of melting stock, the idea being, charge the furnace and then turn on the refining tap. Never, indeed, could the electric furnace seriously compete with the crucible while shoddy was its charge or such an outlook held sway.

This situation, happily, has now been largely rectified; elaborate refining, clever chemical manipulations, etc., now find no place in the manufacture of first grade tool steel. "Only what is in the weigh-pan will be in the finished steel" is now as largely recognized in the new industry as it is in the crucible. Considering the furnace as but 10 years old commercially it will probably be admitted that not much time has been lost in tuning up to crucible pitch.

The writers carefully outlined three standard grades of electric tool steel qualities, both as to selection of melting stock and melting practice, in an article published in THE IRON AGE Sept. 15, 1921, of which just a brief quotation as to melting stock of first quality steel is taken:

> Charge to consist of all heavy melting stock, insuring little oxidation, .....Well under manganese and phosphorus of final specification. American Swedish, rolling mill iron, ingot iron or similar stock being desirable, except as hereinafter provided. Charge shall contain not less than 10 per cent of washed metal or Swedish carbonizing iron..... and not less than 20 per cent but up to 40 per cent of heavy electric furnace tool scrap.....replacing to amount used, stock described above.

There can be no question that where such melting

stock is used the crucible has not the slightest lead, and such materials are used and have been used for some time. Fuller details as to mixture standardization and designing can be obtained from the article, as can an outline of the cheaper grades. The standard mixtures and qualities of the crucible, which have done so much to build up its reputation, are to be found in just as complete a form in the tool steel electric furnace. Continuity of product and standard quality grades are no longer the monopoly of the crucible, but are shared possibly to an equal degree by its youthful competitor.

It is agreed,. therefore, that a full equality in the selection of melting stock is already shared in some quarters by the electric furnace and where not, can be, by the simple duplication of crucible charges. The exception to this is in favor of the electric furnace, which does not require its stock reduced to pot size; indeed, prefers larger material, and so secures a valuable commercial and possibly some slight metallurgical advantage.

## II. Melting Practice

The whole purpose of the crucible process, in so far as melting practice is concerned, is to bring by melting fusion the whole contents of the weigh-pan into one perfect blend of finished steel. Once this fusion is complete and clearly melted, the contents of the pot are killed by what is known as a killing fire, the correct casting temperature attained; then the melting process is complete. No manipulation of slags and no refining is possible and the process is thereby saved this complication, possessed by other melting mediums.

The blend is made in the weigh-pan and substantially no other change can be made thereafter. The melter's concern is largely correct melting and killing, correct casting temperatures and, lastly, due care of his furnace and his pots. He has also the executive control of his crews and also the care of his molds and their correct setting up, but this only indirectly, as of course the molders are directly responsible. He is only rarely called upon to design mixtures though in some cases he is required to act as "weigh-up," in which case he personally weighs his own melting stock, according to mixtures supplied him.

The process is carried out in a sealed crucible with the flame not in contact with the metal of which more will be said later. The conditions in the pot are mildly oxidizing at the start, as can be gathered from the drop in carbon experienced in the Sheffield white pot, and gradually change to mildly reducing as the heat progresses. While this early, mildly oxidizing condition also occurs when using graphite pots, it is not so apparent, for in the later stages this pot throws considerable carbon which is absorbed by the steel and therefore obscures any early loss. Incidentally the amount of carbon thrown in this fashion is not always under perfect control.

### Simplicity of the Crucible Process

Summarizing the foregoing, it will be seen that simplicity characterizes the melting practice of the crucible in so far as chemical reactions and manipulations are concerned, which is significantly one of the strengths of the process. It holds no rewards for ingenious operation, offers no attractive short cuts and tolerates no detours. This has safeguarded the process to quite an extent and, in these days when its monopoly has vanished, is valuable indeed in assisting it to continue a hold on the tool steel business.

The electric furnace from the first held out wonderful refining abilities; the furnace was compared with the chemist's casserole, and these were mistakenly recognized as great advantages over the crucible. Shoddy could be refined and made tool steel. This mistaken idea led to a very complete development of refining methods, slags and manipulations, but these, all right in their place, such as in third grade qualities, competing with the watered stock of the crucible third grades, will not do in the manufacture of first grade tool steel.

The electric furnace of to-day, however, recognizes this to quite a large degree and is operated in the manufacture of tool steel exactly as a large and efficient crucible. Its melting practice is most remarkably like that of the crucible. To briefly quote from our article of Sept. 15, 1921, regarding first quality electric tool steel melting practice:

"Positively no ore additions, mill scale or boiling of any kind tolerated . . . no slag shall be taken off (exposing the bare metal to oxidation). Every attempt should be made to duplicate crucible conditions . . . in melting practice."

### Electric a Repetition of the Crucible

It will be seen therefore that the modern thought on electric tool steel production, in so far as melting practice is concerned, represents an almost exact repetition of crucible practice. The heat is not boiled, slags are not taken off, the quality is in the charge, which has been selected with the same care as the crucible. Chemically the conditions are also most remarkably synonymous.

The electric furnace, when following the lines outlined, is in the initial stages like the crucible, mildly oxidizing. It is oxidizing to about the same degree as the Sheffield crucible, as can be noted by the similar three to five point drop in carbon in melting down. Again, like the crucible, the conditions change to reducing; a slag is formed covering the metal and forming a liquid seal, very much as Huntsman used himself in his early manufacture of crucible steel. This seal is ably supported by tight furnace doors and the strongly reducing atmosphere of the furnace. This is the only steel-making process that does not require oxygen to burn its fuel, and it must be seen therefore that the crucible can make no claims for virtues accruing from a sealed crucible which are not fully shared by the electric furnace. The electric furnace, when run along tool steel lines, can in effect be nothing other than a large efficient, sealed crucible, and its melting practice is readily and successfully amenable to duplication, with the possible advantage in favor of the electric furnace of stronger reducing conditions. The case for equality of electric melting practice seems to be strong, representing as it does so faithful a duplication of the crucible.

## III. Inherent Differences of the Two Furnaces

As to inherent differences resulting from the variation of the types of furnaces employed, crucible or electric, this has necessarily been touched in the foregoing, from which deductions might be taken. We must confess that we can see no difference except in size and efficiency.

Probably the strongest and most important claim ever made for the crucible is the fact that the steel is melted in a sealed crucible and is therefore untouched by flame. How far the electric furnaces duplicate this has already necessarily been suggested, but the following thought analyzes the position somewhat more fully. The Bessemer, open-hearth and crucible processes all require the mechanical delivery of air in large quantities to the hearth of the furnace, in order to make possible fuel consumption. In the Bessemer, the fuel being silicon, and that being found only in the very composition of the metal, it is apparent that no protection can be offered the steel against the ravages of oxidation.

The open-hearth also requires large quantities of air throughout the process to burn its fuel, oil or gas as the case may be. An attempt is made to protect the metal from this strongly oxidizing flame to some extent by carrying a slag at the later stages of the operation.

How ineffectual this is against so consistent and strong an oxidizing flame is apparent by a glance at the appalling alloy loss when present in the scrap or added in the furnace and the extremely oxidized condition of the slag. When one considers the enormous volume of air necessarily introduced into the very hearth of the furnace, the failure to provide any complete protection is not surprising.

The crucible furnace also requires a large and steady volume of air to burn its fuel, whether it be coke, gas or oil, and this has also to be introduced right in the hearth of the furnace. Its flame is an oxidizing one and would do much damage to the steel if no protection could be offered. Protection is, however, supplied to a very satisfying degree. The steel is inclosed in a crucible and the top of the steel is at the later stages covered with a flux inside the pot and the crucible mouth is closed by a lid or cap. It will be seen that the protection against flame is almost complete; is, in fact, complete were it not that several times during the melting process the lid must needs be opened and the condition of the steel investigated by the introduction of a potter and also for the purpose of adding certain alloys or medicine. The degree of oxidation resulting from this is very slight, but that it does exist can be seen from the slight loss of easily oxidized alloys experienced when such are added. It is certain, however, that its protection far exceeds that of the Bessemer or open-hearth, and this, together with its careful melting stock selection, etc., easily explains its dominating position as a tool steel producing unit heretofore.

### Comparison of the Fuels

The electric furnace, which now contends for a share of the honors of the tool steel business, is very fortunately placed in this respect, for it does not require air or oxygen to burn its fuel. Its fuel possesses the striking advantage of being capable of employment in a strongly reducing atmosphere, or for that matter any atmosphere. Vast quantities of air have not to be artificially supplied to the furnace; in fact, none at all is required, therefore the protection problem is almost naturally solved. No crucible need be furnished, though as a matter of fact, a furnace having the major characteristics of a crucible is supplied, and those leaks, by virtue of taking the lid off, in this case opening the doors, and also such as occur from a furnace that is not tight, are taken care of in a very complete fashion. A strongly reducing atmosphere is maintained from very early in the operation, right away to tapping, a liquid seal of a controllable viscosity is furnished and this seal or slag is itself strongly reduced, carrying an excess of carbon available and ready for any stray oxygen that may perhaps come along. This is quite unlike the open-hearth and some idea of its effectiveness can be gathered from the almost complete recovery of a fraction of one per cent of vanadium in the scrap that has been charged. In the direct addition of alloys, excepting, of course, losses due to the volatile nature of the alloys, the loss is almost negligible, and speaking conservatively, certainly not any more than the crucible.

From the foregoing the electric furnace is indeed for all practical purposes a large sealed crucible, and where any differences are to be found, they are in the direction of even greater protection in the case of the electric furnace. It is difficult to find, therefore, any inherent differences that would to any measurable degree affect the quality of the steel, providing the electric furnace is run along the lines suggested. We have therefore but to assume that the case was covered by the two preceding points.

### Conclusions

The case has been outlined and the various points dealt with as they appear to the authors. If what we have said is correct, the electric furnace bids fair to supplant the crucible to a greater degree than heretofore, though it is possible, never completely. A strong case seems to have been made for the electric furnace, which argues the full ability of that furnace to readily and successfully duplicate in quality—"warranted best crucible steel." The case has been dealt with on the premises of three major deciding factors, the investigation of none of which seems unfavorable to the electric furnace. Though these represent the frank opinions of the writers, it is, of course, possible that their findings are not justifiable; of this, however, the reader must be the judge.

If the case is admitted, it seems certain that the electric furnace must assume the dominating position in the industry, by virtue of its powerful economic advantages, which possess so attractive a commercial value. The passing of the crucible seems analogous to the passing of the dreadnought. Whatever the future holds, however, that grand old pioneer, the crucible, has left high standards and marks on the sands of time that will not be effaced.

## American Pig Iron Association Addressed by Colonel Richards

Retiring officers of the American Pig Iron Association were re-elected at the annual meeting held at the William Penn Hotel, Pittsburgh, Jan. 12. Theodore Friend, Clinton Iron & Steel Co., Pittsburgh, continues as president of the association; John A. Penton, Penton Publishing Co., Cleveland, secretary; and Col. F. B. Richards, M. A. Hanna & Co., Cleveland, treasurer.

An interesting talk on the European financial situation by Colonel Richards was a feature of the meeting. It was the speaker's idea that if the war debt of Europe to this country is ever to be paid, it would be necessary for this country to cut down the bill materially and to fund the remainder by long-time bonds. Europe insisted, the speaker said, that it spent most of the money borrowed in the United States in this country, and that, as it paid war-time prices, it was entitled to some rebate. Colonel Richards thought that by remitting or writing off a part of our claims upon European nations, which had borrowed from us, with a corresponding remission by those nations in their claims upon others, including Germany, the situation in Europe would mend more rapidly than would be possible by insistence upon full payments.

There was discussion of freight rates which resulted in a motion empowering the president to appoint a committee of one or two to go to Washington to present the claims of the association that freight charges on pig iron from all centers of production to consuming points are so high as to hamper business.

## German Hardware in Damascus

WASHINGTON, Jan. 17.—Practically all the hardware and tools being sold in Damascus are of German manufacture, the low exchange value of the German mark favoring the introduction of German goods in spite of the fact that the reappraisement system now being practised by the Syrian customs authorities has the effect of increasing the duty on some kinds of German goods to as much as 50 per cent ad valorem while the legal duty is only 11 per cent ad valorem. This control by Germany of the market in Damascus is set forth in a report on "Metals and Hardware" received by the Bureau of Foreign and Domestic Commerce from Consul Charles E. Allen, dated Dec. 3, 1921.

There is a brisk demand for all kinds of small hardware, the report states, the machine-made foreign product, on account of its greater symmetry, attractiveness and, latterly, cheapness, having begun to force the ill-formed, though durable, local hand-made product out of use. The making of tools, nails and all kinds of small hardware by hand is still an important local industry, but it is daily becoming increasingly difficult to compete with the foreign industry. In fact, the report points out, it can only do so because time has not yet come to have any value in Damascus.

# PATENT BILL PASSED

## House Approves Measure Which Will Be Urged in the Senate

WASHINGTON, Jan. 17.—The Lampert patent bill, which has the strong support of engineering societies and industrial interests of the country, passed the House Thursday by a vote of 198 to 36, and efforts are now being made to get it through the Senate. The bill is now before the Senate Committee on Patents and it is hoped it will be put through and enacted into law at an early date.

While it was supported by a large majority in the House, the measure also was the source of considerable opposition at the hands of such members as Majority Leader Mondell and Representative Madden, chairman of the Committee on Appropriations. The general attitude of those opposing the measure was based on the ground of the necessity for so-called economy, and the contention that the legislation provided should be taken care of in the Lehlbach classification bill providing for salary adjustments throughout the Government service, but carrying less increases for Patent Office employees than allowed by the Lampert bill.

The Lampert bill provides for increases in personnel as follows: One law examiner; 26 assistant examiners and 21 clerks, aggregating 48 additional employees. Increases in salaries are made as follows: Commissioner of Patents, from $5,000 to $6,000; first assistant, from $4,500 to $5,500; second assistant, from $3,500 to $5,000; examiner-in-chief, from $3,500 to $5,000; solicitor, from $2,750 to $5,000; chief clerk, from $3,000 to $4,000; law examiner, from $2,750 to $4,000; principal examiners, from $2,700 to $3,900; first assistants, from $2,400 to $2,900, $3,100 and $3,300; and second assistants, from $2,100 to $2 500 and $2,800.

In order to cover the additional cost of conducting the Patent Office by reason of increased salaries, the bill provides an increase in the fees. Practically all of the work on a patent is done when the application is first made, and the initial fee is $15. The secondary fee upon the granting of the patent, under the present law, is $20. The Lampert bill raises the first fee from $15 to $20, and it is estimated that it will bring into the Treasury over $500,000 annually. It is declared to be the only piece of legislation in the way of wage increase that not alone pays for itself but will bring revenue into the Treasury. It was this feature of the bill that played an important part in destroying the argument of those who opposed it on the grounds of economy. The measure also gained strength because it omitted the Federal Trade Commission rider.

The extreme importance of the legislation has been repeatedly pointed out by its proponents in industry and engineering societies and was emphasized by Representative Lampert and others. He repeated figures heretofore given regarding the large number of resignations owing to the low salary scale and showed that during the calendar year 1919 the number of patent applications filed arose to over 76,000, exceeding by 19,000 the number in 1918, while 1920 exceeded 1918 by 24,000 patent applications, and 1921 exceeded 1918 by 30,000. Increase of work was also shown in the cash receipts of the Patent Office, which in 1918 amounted to $1,977,000; in 1919, $2,417,000; 1920, $2,680,000; and 1921, to $2,775,000, an increase of $800,000, or 40 per cent over 1918. Mr. Lampert said that the increase in work is overwhelming and that the Patent Office is hopelessly in arrears. There are now 59,000 patent applications and 6000 trade-mark cases awaiting action, and with more than one-half of the force composed of untrained men, it was declared that the Patent Office cannot escape going further in arrears.

"Even with the relief afforded by the present bill," said Mr. Lampert, "it will take several years to build up the present force, with so many inexperienced men, into a stable, competent examining corps, able to make any material impression upon the arrears of work already piled up."

# AUTOMOBILE PRODUCTION IN 1921

## More Than One Million Tons of Steel Used—Considerably Less Than in 1920

Estimating the average weight of iron and steel per passenger automobile at 1500 lb. and the average weight per truck at 2250 lb., the total amount of iron and steel used in automobile construction during the year was apparently about 1,175,000 gross tons. This is approximately 9 per cent of the year's output of rolled and forged steel. The figure is based on a total production amounting to 1,680,000 cars and trucks, of which 145,000 or 8.63 per cent were trucks, and the remainder passenger and other light cars, according to the National Automobile Chamber of Commerce. The total figure is a reduction of 24 per cent from the 1920 output.

Passengers to the number of 6,000,000,000 are said to be carried annually by motor cars. This compares with 1,100,000,000 carried by the railroads of the United States annually, and with 1,418,000,000 carried by the rapid transit (elevated and subway) lines of New York, in the year ending June 30, 1921. Freight annually handled by motor truck is given as 1,200,000,000 tons, which compares with 2,290,000,000 tons of freight carried by the railroads, this being the average of 1917 and 1918.

It is stated that the wholesale value of the cars and trucks produced in 1921 was $1,222,350,000, a reduction of 45 per cent from 1920. The value of automobiles was stated at $1,088,100,000, or $702 per car, a reduction of 21¾ per cent from the $897 average of 1920. The wholesale value of motor trucks produced is given as $134,250,000, an average of $968 per truck, or a reduction of 24 per cent from the $1,273 average of 1920. Tire casings amounting to 19,379,000 were produced, together with inner tubes to the extent of 24,157,000 and solid tires numbering 377,000.

The figures given show an approximate total of 10,000,000 automobiles registered in the United States, of which 9,000,000 are cars and 1,000,000 are trucks. Of the total, 3,000,000 or 30 per cent are reported owned by farmers, the farmer ownership of trucks being 150,000, or 15 per cent of the total trucks, and of cars 2,850,000, or 31.7 per cent of the total cars.

## Electric Melting and Heat Treating Furnaces Designed by Students

Four types of electric furnaces, designed and constructed largely by students, are being built for use of the department of chemical engineering, college of engineering, University of Wisconsin, Madison, in the course of electric furnace practice.

A special resistor electric muffle furnace which will stand a temperature up to 3600 deg. Fahr., now under construction, is unique in that it combines all of the advantages of a gas furnace with the higher temperature and temperature control possible in an electric furnace. This stove is fitted for investigation of refractory materials and heat treatment of metals over the highest temperature range. As it will operate continuously at or over 2000 deg. Fahr., with only 4 kw., at a cost of but 6c. per hr., or one-fifth as much as it costs to operate a gas furnace under similar conditions, this furnace is regarded as having exceptional economic qualities.

Another furnace under construction is an electric arc furnace. No lining is used, the shell being kept from melting or oxidizing by a constant spray of cold water from a perforated pipe which surrounds the furnace. It has a melting temperature of 4000 deg. Fahr., and will be used for smelting various ores.

An Arsem vacuum furnace has recently been rebuilt. All air is pumped out to prevent combustion by oxidation. Temperatures up to 5000 deg. Fahr. may be obtained by passing an electric current through a spiral graphite tube.

The fourth type of furnace is an electric carbon resistance type for determining the load carrying capacities of firebrick and other refractory ware.

# Applications of Continuous Die Rolling*

## Especially Adapted for Making Forging Blanks— Macrographs and Micrographs Show Smooth and Uniform Metal Flow

BY G. R. NORTON

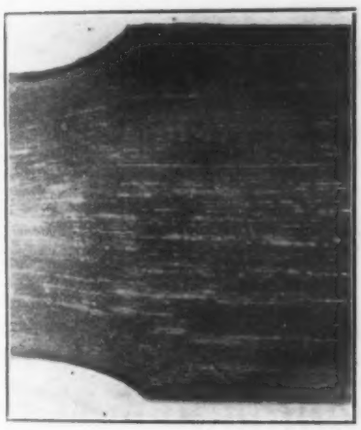
CONTINUOUS die rolling is the process of producing bars in which the form of cross-section is varied according to impressions sunk in the pair of rolls between which the final pass is made. At each revolution of the rolls the design cut in their surfaces is repeated on the bar passing between them, and the number of these repetitions is limited only by the length of the bar.

Wagon-box straps and axle-clip sections have been produced in this manner for years. In these bars, a round alternates with a half-oval or bevel-edged flat and the change in section is accomplished by passing a round bar between the rolls, allowing the bar to pass for a certain distance without change, after which it is flattened and spread for the desired length of this part. The number of round and flat sections produced at each revolution will, of course, depend on their lengths and the diameters of the rolls.

In rolling sections of this character it is not necessary that impressions be formed in both rolls, because the round has been produced by straight rolling and it is only necessary to change its shape; so one roll can have a plain surface, the impression being cut in its mate. This usually results in a slight flattening of the round, which would be objectionable if great accuracy of size were required. The bars become oversized as the rolls wear in service and, if dressing is done by turning off the surfaces of the rolls and recutting the impressions, a loss in circumferential length results which changes the lengths of the impressions.

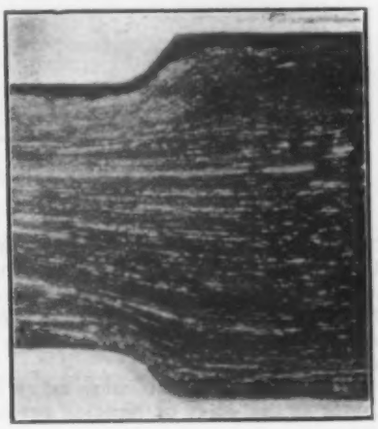
Continuous die rolling as developed by the Witherow Steel Co. has as its basis the production of more complicated sections with greater accuracy. This is accomplished by building up the active surfaces of the rolls, instead of sinking impressions in the ordinary roll casting. Cast or forged rings, of material suitable to the character of the section to be rolled, are cut into segments, in the outer surfaces of which complete impressions or parts of impressions are sunk. The rings are assembled on mandrels to which they are locked. This segmental construction, or building up the groove, involves but little material as compared with a solid roll, and provides for easy and inexpensive dressings, repairs or changes. Wear on these rolls can be compensated for in various ways and the length of any impression held constant.

To produce sections symmetrical about their longitudinal axes, followed by other sections that may be offset, it is necessary to provide for the exact matching of the opposing rolls. This is done by mounting pinions on the rolls opposite the driven side. As only one roll is driven from the roll train and always in the same direction, these pinions are used to match the rolls exactly and are provided with adjusting devices for this purpose. Once the rolls are properly matched, there is no variation in the alinement of the impressions. It can be seen easily that, to handle this class of work economically, considerably more equipment than one finishing stand of rolls is necessary. The leader or bar, on which the forming pass is made, cannot in all cases be a predetermined shape and must be found by trial. Frequently leaders are made that do not conform to any standard commercial shapes and would, therefore, be difficult and costly to obtain. The heating, handling and rolling of single bars would operate against good production and increase costs. It is necessary, therefore, to work from billets that are roughed down and rolled to the desired form of leader, according to usual rolling practice, and finished in the same heat. This method has a considerable advantage metallurgically, because the billets are brought slowly from atmospheric to rolling temperature in continuous furnaces and can be timed to take the last pass at the proper finishing temperatures. The metal is worked uniformly and completely in one direction and its flow, as exhibited by studies of the macrostructure, is more uniform than in forging.



A Rolled Shaft (Two diameters)

A Forged Shaft (Two diameters)



An Upset Shaft (Two diameters)

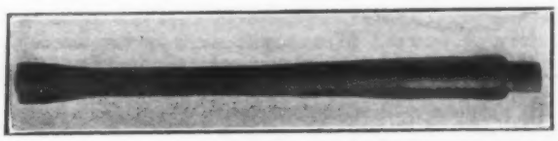
It should be understood clearly that continuous die rolling bears no relation to the forming of variable-section bars on forging or eccentric rolls, where the stock is cut to the desired weight and each piece is handled individually, a large number of passes being made and the stock rotated 90 deg. at each pass.

Generally, it is held that hammering has a refining effect on steel and is a much superior method to rolling. Charpy showed by experiment and tests that certain physical properties are varied according to the amount of work done, independently of the method. By the amount of work done is meant the reduction of area

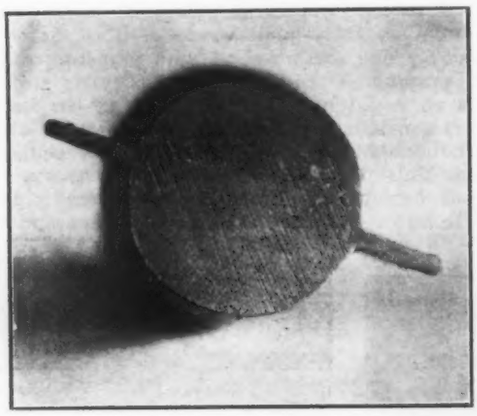
*Paper substantially in full as presented at the annual meeting of the Society of Automotive Engineers, Jan. 10, 11, 12 and 13. The author is steel works manager of the Witherow Steel Co., Pittsburgh. An exclusive article by Mr. Norton appeared in THE IRON AGE of Jan. 6, 1921, on "Rolling of Variable Section Steel Bars."

from the original to the finished section, and the ratio of the original area to the worked area is called the coefficient of work.

To demonstrate the relative values of different processes, the amount of work done being the same, a 2-in. round billet, of 0.45 per cent carbon open-hearth steel, was rolled into a rear-axle drive-shaft having maximum diameters of 1-9/16 in. at the wheel and spline ends and a minimum diameter of 1-3/16 in. at the end of the long taper next to the spline end. From the same billet, duplicates of this shaft were forged and a bar was rolled



Continuous Die Rolling Produces a Flash



A Cross Section of a Rear-Axle Shaft Showing the Flash

1-3/16 in. in diameter on which upsets, 1-9/16 in. in diameter were made, the lengths of the upset being the same as those of the rolled and forged shafts. The reduction of area from the billet to the smallest diameter of the shaft was 64.75 per cent, or a coefficient of work of 2.84.

Charpy impact tests were taken on the axes of the shafts at the point of junction between the long taper and the spline end and an examination made of the microstructure and macrostructure. A second set of shafts duplicating the first was heated to 840 deg. cent. (1544 deg. Fahr.), held 15 min., quenched in oil and the impact tests and microscopic examinations repeated. The accompanying table shows the result of these tests and indicates that the method of working is a factor

*Charpy Impact-Tests*

| Tested Melted on | Energy Absorbed, Ft.-Lb. | Strength, Per Cent | Increase by Treatment, Per Cent |
|---|---|---|---|
| Rolled shaft, untreated..... | 13.59 | 100.0 | .... |
| Forged shaft, untreated.... | 6.32 | 46.5 | .... |
| Upset shaft, untreated..... | 4.85 | 35.7 | .... |
| Rolled shaft, treated..... | 18.06 | 100.0 | 32.9 |
| Forged shaft, treated..... | 14.08 | 77.8 | 123.0 |
| Upset shaft, treated..... | 10.83 | 60.0 | 123.2 |

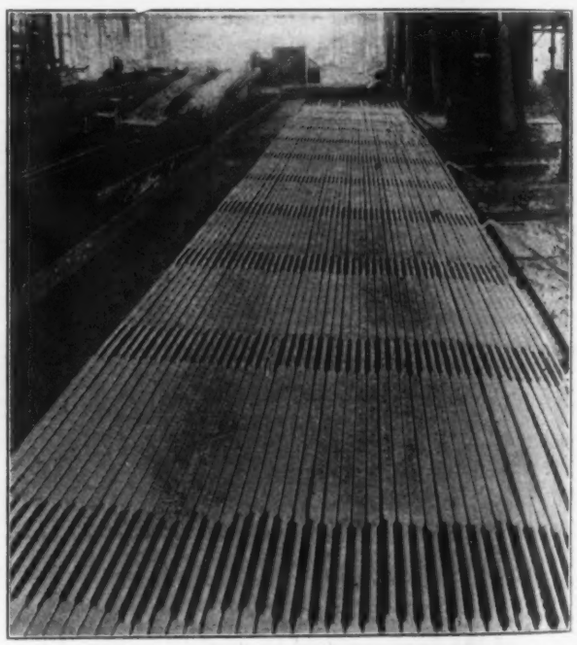
to be considered seriously in connection with the physical properties of steel.

The accompanying macrographs and micrographs show a smoother and more uniform flow of metal in the rolled specimens than in the others and a better refinement of grain-size before treatment. This is due to the fact that continuous die rolling is a continuous process of working rather than discontinuous, as in forging, upsetting or eccentric rolling.

In continuous die rolling, it is not possible to make successive forming passes because of the difficulty in entering a partially formed bar at exactly the right point in the impressions in the rolls; so the entire forming must be accomplished in one pass. When very great reductions of area are necessary, some flash or overfill will occur. The bar will be extruded between the rolls to a considerable extent but, at some point, depending upon the character of the section, the volume displacement cannot be carried further in the impressions and the rolls spring apart, relieving the grooves and allowing a portion of the metal to spread between the faces of the rolls. This flash can be controlled to some extent and may vary in thickness from 1/32 to ⅛ in. As the bar does not rotate in the pass, any flash produced is straight and can be removed easily by trimming.

It has been found that the sectional forms into which bars are changed materially affect the amount of flash and extrusion that takes place, and no rule has been found to govern all cases. However, because the rolling is in effect reducing or drawing with but little spreading action, the flash will always be considerably less than would be produced on the same piece under a hammer and, consequently, the wastage of stock is less.

Many forgings require preliminary operations, such as upsetting or drawing, before the stock is in such form as to be struck easily in finishing impressions without excessive waste and wear on dies. Frequently, so much work of this character is involved that two tools are necessary to complete the forging and, as the



Tie Rods After Delivery from the Continuous Die Rolls

preliminary and finishing operations are not balanced exactly, and in many cases cannot be completed in one heat, time is lost and much expense is incurred. Continuous die rolling provides a means of supplying blanks for forging that can be struck directly in the finishing impressions in the dies, or struck after one or two edging blows, if offsets or bends are required to be made. A properly designed blank can be reproduced with great accuracy, eliminating the forging scrap caused by blanks made improperly under the hammer.

Front-axle I-beam blanks that can be finished under one hammer for either the Elliott or reversed-Elliott type of axle, can be rolled. Blanks for camshafts, ready to strike for finishing, can be rolled, thus eliminating the blocking or upsetting operations and the rolling-in dies immediately preceding forging. Spring-clips can be rolled with the offsets for bending exactly as forged. A small amount of flash is produced, which requires cold-trimming before the clips are bent. Rear-axle drive-shafts can be rolled and, after trimming, are ready for hardening and machining.

The product of continuous die rolling is received from the mill in the form of long bars, in lengths that are multiples of the lengths of the individual pieces. The length of these bars will depend upon the weight

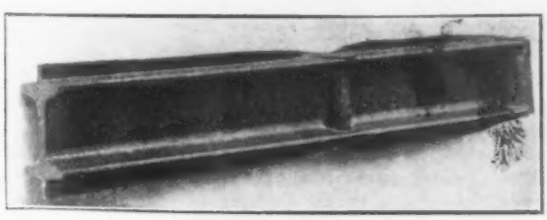
of billet used. After cooling, they are cut into ordinary mill lengths or into single pieces. After this, trimming or any finishing operations can be performed.

Quantity is obviously essential to the economy of operation, because the expense of cutting rolls and setting up a mill could not well be carried by a few pieces. The cost of this type of conversion naturally must be

This Illustrates the Possibilities of Continuous Die Rolling Where Round, Square and Hexagonal Cross-Sections Alternate

greater than ordinary conversion from billets to bars, for this work is necessary as a preliminary to the final die forming; also, to the bar-conversion cost must be added the costs of the die rolls and their maintenance, special forms of guides for delivery and adjusting gears for matching rolls. Production is decreased also, because of the necessity for lower mill speeds than are usual in rolling practice.

In addition to working out the patented features of roll construction and mill design, a long and costly series of experiments was necessary before continuous die-rolled products could be marketed and sufficient data collected to predict with reasonable accuracy the performance of any given variable section. Conversion is made on the usual basis of one gross ton of billets to one net ton of bars, the bar weight including any flash or gates between impressions of course.



The Rolling of Front Axle I-Beams Presents a Problem Because of the Marked Variations of Cross-Sectional Area

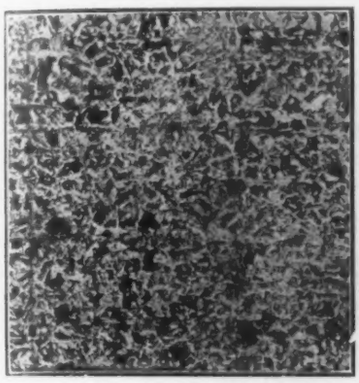
The size and length of pieces produced by continuous die rolling are limited only by the capacity of the mill and the diameters of rolls that can be accommodated in the housings. The equipment operated by the Witherow Steel Co. covers sections from 5/16 in. in diameter to 3-in. squares; and the lengths of individual impressions may vary from a fraction of an inch to 17½ ft., rolls 68 in. in diameter being necessary for this length. The application of the product of this process is largely a matter of the study of local conditions in any manufacturing plant, but the automotive industry generally offers a wide field for its consumption by reason of its quantity-production requirements and the large number of forgings used.

From its beginning, the practice of rolling has been improved only along the lines of increasing the tonnage capacity of mills, without much effort to depart from the manufacture of standard rolled shapes and bars of constant area and form of section; so, the development of continuous die rolling on a commercial basis for the production of variable-section bars is something new in an industry in which few radical changes have taken place.

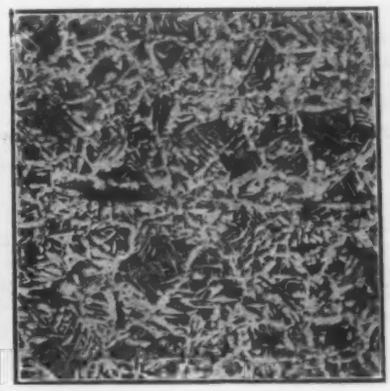
## National Council Will Consider Railroad Situation

WASHINGTON, Jan. 17.—The railroad situation and what should be done about it from the business standpoint will be considered at a meeting of the National Council of the Chamber of Commerce of the United States to be held in Washington Feb. 8 and 9. The council is made up of one representative each from the 1400 business organizations within the membership of the chamber.

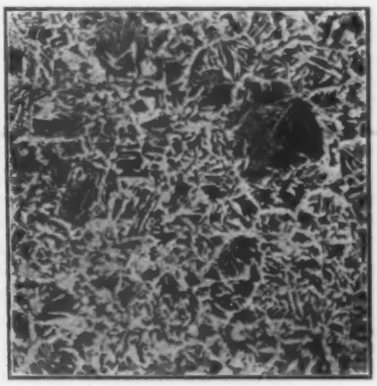
Some business men who have followed closely the railroad situation since the roads were turned back to private control, see a drift toward Government ownership and operation unless there can be worked out some plan by which the roads can be put on a self-supporting basis. They feel that the transportation act should be given a longer trial and that attempts which are being made in Congress to amend the act, if successful, will precipitate a crisis which may make it impossible for the roads to continue under private management. As yet, in their opinion, such an increase in earnings as has been attained may have been reached at the expense of proper maintenance.



An Untreated Rolled Shaft
(100 diameters)



An Untreated Forged Shaft
(100 diameters)



An Upset Shaft
(100 diameters)

The California Foundrymen's Association, one of the oldest organizations of employers in San Francisco, has disbanded and amalgamated with the California Metal Trades Association. Walter W. Johnson, Union Construction Co., was elected president, and M. E. Wright, Atlas Imperial Engine Co., vice-president, at the annual meeting of the Metal Trades Association. The annual banquet of the association will be held early in January.

In the course of the study of heat treatment of non-ferrous alloys, in progress at the Pittsburgh Experiment Station of the Bureau of Mines, annealing experiments are being carried out on leaded brass tubing for the purpose of examining the effect of temperature on the hardness. Tensile tests have been made of heat-treated non-ferrous alloys, and metallographic examinations made.

The Dodge Mfg. Co., Mishawaka, Ind., has declared a dividend of 1 per cent on the common stock, a decrease of ½ per cent from the last previous dividend in October. The regular quarterly dividend of 1¾ per cent on the preferred stock was ordered paid Jan. 1.

## Cost Accountants Indorse Standard Invoice Form of Purchasing Agents

At the last meeting of the executive committee of the National Association of Cost Accountants, on the recommendation of C. H. Smith, director-in-charge of standardization, a resolution was adopted indorsing the standard invoice form recommended by the National Association of Purchasing Agents. Mr. Smith has prepared the following brief history of the movement:

The vast conglomeration and variety of printed forms has been a bane of existence to every man connected with any of the clerical branches of a business organization. At the convention of the National Association of Purchasing Agents in October, 1918, the cry for a standardization of the invoice form again made itself heard. The convention appointed a committee to take up the subject and report at the next meeting. This committee immediately entered upon a campaign of intensive work. They engaged the interest of some 275 associations and 125 trade papers and asked for their co-operation. In September of the following year a tentative standard invoice form was presented to a conference in Philadelphia. At this meeting representatives of the United Typothetae of America, as well as other trade associations and purchasing agents were present. Three other tentative forms were submitted for consideration. Nothing definite was done, however, and the following year another standardization conference was called in Chicago on Oct. 9, 1920. Here a fifth form was developed, and this last one was finally approved by the various associations present, which included the Typothetae, the American Railway Association, the National Association of Purchasing Agents and numerous other trade and professional organizations. Following this conference the National Association of Purchasing Agents approved unanimously the form as evolved in Chicago.

### Form Corresponds to Bank Checks

The one factor which finally influenced its selection was that it would conform with the size of the standard form of bank checks, which had been adopted by the American Bankers' Association in January, 1909. This check was not only adopted by the Federal Reserve Board at its organization in 1914, but also by over 100,000 business houses throughout the country. From this standard check form there was evolved the standard voucher size.

The committee having in charge the development of the invoice considered that, because so many firms were filing copies of invoices with copies of vouchers, that they should be of such a size so as to file together conveniently. Thus it was that the size of 8½ x 7 in. was adopted as the controlling standard for invoices, which is the same size as the standard voucher and twice the size of the standard bank check, which is 3½ x 7 in.

In order to accommodate invoices of larger size it was decided to have the dimension 8½ in. remain the same in all cases, but that the other might vary between 7 in. and 14 in., the idea being that anything over 7 in. would be folded back on the 7-in. line, thus providing always a sheet 8½ x 7 in. for filing purposes. To accommodate the printer and lithographer a tolerance of ⅛ in. in either dimension was provided for, so that invoices, when padded, could be trimmed to the proper size.

It is recommended that where invoices are longer than 7 in., dots or short rules be placed down from the top on the sides, to indicate to the file clerk the proper point for folding for filing purposes. It is also urged that all invoices be cut from 17 x 22 or 17 x 28-in. stock. It finally might be pointed out that it is not necessary, in every instance, to utilize each and every blank provided on the form. For example, if there was no contract number that space on the form would be left blank. In a similar way other spaces on the form may not apply in each and every instance, but the form is expected to cover a large majority of cases without the need of a rubber stamp, which has been the case heretofore.

It is customary with all corporations to use rubber stamps on invoices received to provide certain blank spaces, where individuals, approving invoices, may insert their initials to show that the prices, calculations and other features are correct. This standard form carries a column reserved for the buyer, which will obviate the use of a rubber stamp on millions of these invoices, thus greatly reducing the labor and expense of handling them.

## Societies of Detroit Affiliated

The affiliation of the architectural, engineering and other technical societies of Detroit became an accomplished fact Jan. 1 by the ratification of the proposed constitution and by-laws, acceptance of membership and election of councillors by the following twelve societies: Detroit section, American Society of Civil Engineers; Detroit chapter, American Association of Engineers; Michigan chapter, American Society of Heating and Ventilating Engineers; Detroit post, Society of American Military Engineers; Detroit section, American Society of American Mechanical Engineers; Detroit-Ann Arbor section, American Institute of Electrical Engineers; American Institute of Chemical Engineers; Detroit Engineering Society; American Chemical Society and Detroit Chemists; Michigan chapter, American Institute of Architects; Detroit section, Michigan Society of Architects; Detroit chapter, American Society for Steel Treating.

The permanent council met and organized Dec. 13, 1921, and elected officers for 1922 as follows: Chairman, P. W. Keating; vice-chairman, A. A. Meyer; secretary-treasurer, Walter R. Meier.

A central office will be established for conducting the business of the several societies. In the past, the several societies each held a number of meetings throughout the year. Most of the societies met regularly once a month and some of them two and three times a month. In the past the meetings of the various societies have often occurred on the same date. This conflict of dates will hereafter be avoided as the office of the new association will schedule the dates of meetings of all the technical societies. The Associated Technical Societies of Detroit will provide one meeting each month and this meeting will be under the management of one of the member societies. This member society will provide the speaker on a broad subject of interest to the members of all the technical societies.

The paramount use given for the new association to its members and to the public is an opportunity for public service both for the city of Detroit and for the state of Michigan. The association will take an active interest in all matters wherein engineering, architectural and technical subjects are an important factor. The council will study the opinions of the membership and will assist in furnishing definite and accurate information to the public.

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The papers to be read at the iron and steel meeting of the Meriden, Conn., branch of the American Society of Mechanical Engineers, at the Home Club, Colony and Foster streets, Meriden, Jan. 19, are the following: "Development and Manufacture of Furniture and Truck Casters with an Outline of the Growth and Progress of a Modern Plant Producing these Wares," by William A. Schenck, first vice-president Bassick Co., and J. A. Johnson, chief engineer of the M. B. Schenck division of the company. "Some Relations Between the Properties of Iron and Steel and their Crystalline Structure," by Bradley Stoughton, consulting engineer, New York.

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The January meeting of the Washington Chapter of the American Society for Steel Treating will be addressed on Friday evening, Jan. 20, in the ballroom of the Harrington Hotel by T. H. Nelson, steel works manager Henry Disston & Sons Co., Philadelphia. His subject is "A Comparison of American and English Methods of Producing High Grade Crucible Steels."

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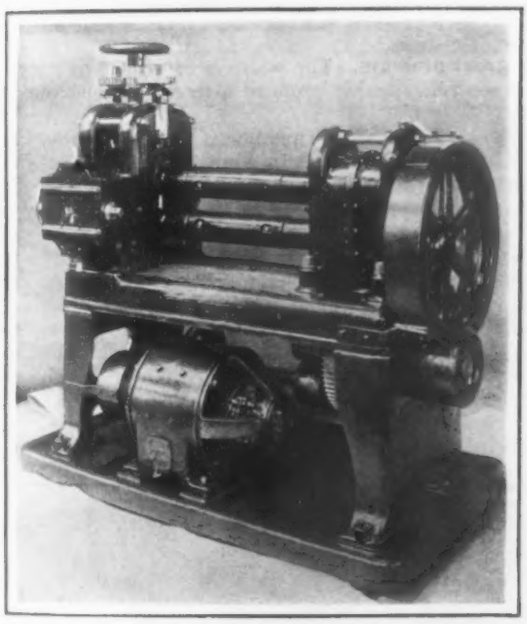
Hyatt roller bearings are to be used for the main tables of the 34-in. blooming mill of the Allegheny Steel Co. at Brackenridge, Pa.

# Tandem Rolling of Cold-Rolled Steel

## Special Equipment Developed for This Purpose, Including Rolls and Their Housings, Wire Straighteners, Edge Rolls, Turk's Head and Cross Slides

A NEW method used in producing cold-rolled wire and flat steel stock by the operation of rolling mills in tandem is introduced by the Standard Machinery Co., Auburn, R. I. By this method production of both light and heavier work is increased approximately 100 per cent, with a lower labor cost than by other multiple simultaneous rolling operations, and with safety to the operator. The process involves new features in rolling mill construction and attachments, as well as the electrical control of the roll speeds, and the introduction of new coiling reels for taking care of the stock after it is rolled. In dealing with these new features, however, further reference to the reels is omitted, because they relate to a separate machine and therefore a separate proposition.

In reducing from the round wire stock to the flat



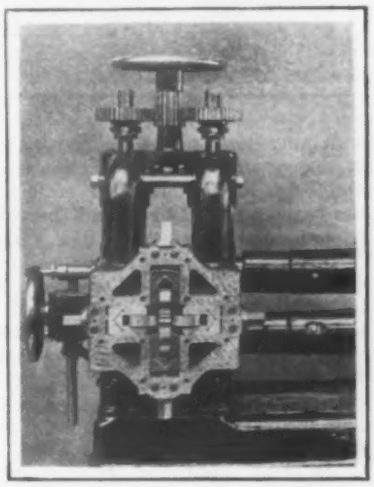
strip the element of elongation is a serious consideration. When several mills are used, the finishing mill must operate at a speed above the efficiency point to compensate for the elongation, and the entering mill at a speed far below its best efficiency. The Standard Machinery Co. in practise has definitely established that the tandem method of wire flattening is more efficient than when any greater number of mills are operated simultaneously.

To perform the tandem process successfully, however, the rolling mills have to be "tooled up," as it were. That is, every operation is facilitated, so that the total elapsed stoppage time is reduced to a minimum. In addition, the mills are equipped with every safeguard possible, to inspire confidence in the operator as to his work and safety. By the adoption of the various attachments and width controlling devices, therefore, it is possible to reduce to a minimum the personal equation, and consequently to employ unskilled labor to operate the mills. The savings effected by the tandem rolling, more particularly on low carbon steel, obviously are important, inasmuch as one operator can now produce more than four men by the old method.

Before treating the method of setting the mills to operate in tandem, some of the construction features and attachments will be discussed. All rolls are water cooled. An intake pipe connected with city water, or, if preferred, with a force pump, enters the roll at one end. It carries the coolant to the extreme further end, where it escapes through eight holes to the inside surfaces of the roll. The coolant then flows back the entire length of the roll and out and away through an outlet pipe. No section of the roll, therefore, is without coolant properties, an important point, as will be noted later when roll speeds are discussed.

Two photographs show a Standard mill for light work, with a turk's head or adjustable draw plate attached, the draw plate face being removed in one photo, of which mention is made later. The mill occupies 3 ft. 4 in. x 5 ft. 8 in. floorspace, and stands 5 ft. 6 in. high. It is equipped with a 7½-hp., variable speed, d.c. motor, 600 to 1800 r.p.m., and including the motor weighs 6500 lb.

Particular care is taken to incorporate rigidity in design into each mill. The ways of all housings are hand scraped, and each housing is keyed to the bed, the housings being properly alined upon the bed of the mill



General View of Roll Set with Rolls 6 In. in Diameter with 4½-In. Face; the Detail View Shows the Turk's Head or Adjustable Draw Plate Attachment, with the Draw Plate Face Removed

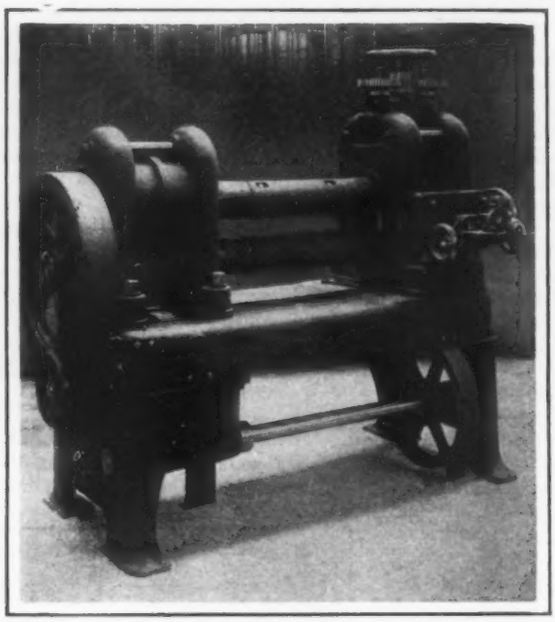
before being keyed and bolted. This alinement is important in saving power. The bearings in the gear housings, as well as on the driving trains and intermediate trains, are also hand scraped, thereby insuring maximum efficiency. All bearings have suitable oil holes and cups. Where an oil hole is not accessible, it is connected with tubing so that it is unnecessary to dismantle the mill to lubricate it. In addition, the gearing and driving mechanism are protected from dust and dirt by detachable covers and guards, which also remove the possibility of accidents to the operator.

The gears in the pinion housings are of forged steel with cut teeth, and revolve in oil. The pinion bearings are of high grade phosphor bronze, and on the roll necks operate the company's standard journal bearings. The latter revolve inside hardened and ground half shells, and eliminate practically all friction that exists in a plain bearing housing. The intermediate, driving and motor gears are of cast steel with maag teeth, and all pinions, with the exception of the herringbone, are of fabroil steel with maag cut teeth. The intermediate bearings are of high-grade phosphor bronze.

After the herringbone pinions have been forged, machined and cut, they are then forced by hydraulic pressure on arbors. Aside from their powerful and rugged features, they develop a smooth and even running on heavy, light and fine loads. The character of the gearing permits the work to be held close to gage, and the work therefore is free from waves and kinks. The mills are equipped with friction clutches, self-contained cone clutches for light transmission, and rim

finger friction clutches for heavy transmission when driven by belt. Direct connected mills are direct connected by gears, and do not as a rule have friction clutches.

As intimated in describing the coolant system, the mills are furnished with shell rolls of the best material obtainable, well proportioned, and designed especially to withstand heavy strains. They have in this case a 4½-in. face, and are 6 in. in diameter. The wabbler



ends may be any of the different designs usually found in rolling mills. The journals are 3⅜ in. in diameter, and 5 in. long. The gear ratio of the mill, including the motor, is 19.2 to 1, and the roll speed 63.7 to 191.1 ft. per minute, or 30.4 to 91.2 r.p.m.

Adjusting screws in the roll housings are of high carbon chrome steel, oil treated. Each mill is actuated by a single indexed hand wheel operated through a center pinion, or can also be actuated by independent screw adjustment. When the hand wheel is employed for setting down the rolls, the liability of setting one end of the top roll lower than the other is eliminated, and accurate results are thereby assured with a saving of time.

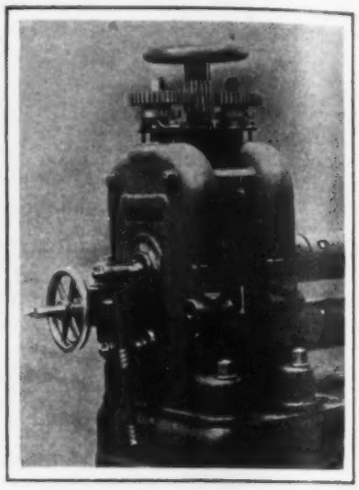
In two additional photographs is represented a mill in the same class with the one before shown, except that the rolls are 8 in. in diameter, with 4 in. face, while the diameter of the journals is 4 in., and the length 5½ in. The gear ratio of the mill, including the motor, is 25.6 to 1, and the roll speed 68 to 135 ft. per min., or 32 to 65 r.p.m., for the motor applied here is a 15-hp., variable speed, d.c., having 825 to 1650 r.p.m. This mill, as can be readily seen, is larger and heavier than the first one described. Without its bed plate, but including the motor, it weighs 7000 lb. With the bed plate it weighs 8200 lb. It occupies floor-space 3 ft. 8 in. wide and 6 ft. 6 in. long, and stands 6 ft. 3 in. high.

One illustration is a close-up view of the edging device, used on both mills. This photograph gives at the right a view of the water cooling arrangement as it enters and leaves the rolls. The second shows the mill in whole arranged for motor drive, but without the motor, and with the edging device. One photo shows part of one of these mills without either the edging device or the turk's head upon it. It is shown here for the purpose of disclosing the dovetail planed in the roll housing to permit lateral adjustment of the turk's head. This lateral adjustment permits all surfaces of the hardened and ground roll to be utilized, no matter what the size of the stock.

As to the devices and attachments, they are:

*Straightener*—A wire straightener is necessary when crooked and bent stock is to be used. This device is fastened to the mill cross slide. The wire in passing through it is straightened simultaneously with the roughing pass. It is not absolutely necessary, however, to employ the straightener unless imperfect wire is used, but better rolling results are obtained by its application under all conditions of the wire to be rolled. Adjustment of the straightener is by hand screw.

*Edge Rolls.*—Edge rolls are used on second and subsequent passes, for width control, but are limited to passes having considerable cross-sectional area, otherwise the wire will tip or buckle in rolling the edge with

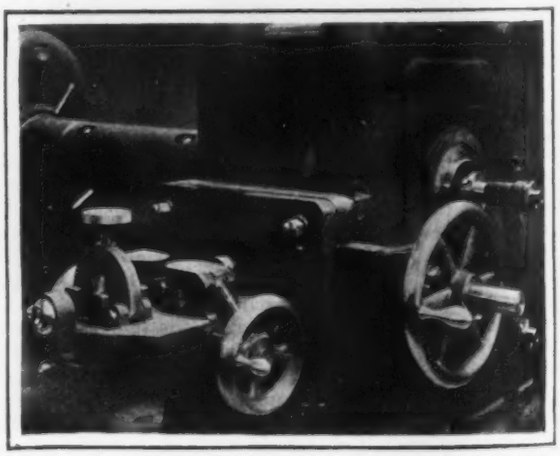


General View and Detail View of Roll Set with 8-In. Rolls of 4-In. Face. This is a much heavier outfit than that first shown. The details shows, at its left, the entering and leaving pipes for cooling liquid; it shows also the dovetail permitting lateral adjustment of the Turk's head

any great pressure. The width is controlled by grooves in these rolls, which produce a finely finished edge or side.

*Turk's Head*—The function of the turk's head is to limit the width of the strip while holding the thickness with exactness, and to prevent tipping of the wire under heavy pressure. It is efficient and superior to the common edging devices. Provision is made for four indexing adjustments, one on each of its four sides, making possible lateral as well as other adjustments. The range of adjustments therefore is more than sufficient for all work for which the mills are constructed. The rolling mills are so built that the turk's head can be attached to the front or the rear of the roll housings, as necessary.

*Cross Slides*—Cross slides are necessary to facilitate frequent shifting of guide and attachment positions,



Close-up of the Edging Device on the 8-In. x 4-In. Rolling Mill, with Coolant Pipes at Right

and in order that both entry and exit slides may work in unison on each mill. By this arrangement there results an even wear on the entire surface of the rolls.

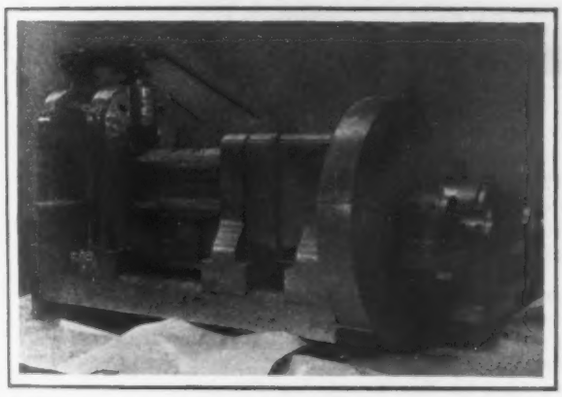
These edging devices and turk's heads are innovations in rolling mill practise. By their adoption mills of these sizes are large producers of round wire into flat stock by the tandem method because of the efficient speeds at which the mills can be operated. In addition, the element of low equipment upkeep costs, as well as low labor charges, and the low ratio of power consumed per flat stock produced by the adoption of these attachments, is significant.

The method of setting the mills to operate in tandem is as follows:

First, the two mills are used without either turk's head or edging device. These mills operate plain, and are set up one in back of the other. The third mill has the edging device attached, and the fourth mill the turk's head. Each mill has its individual motor. For illustration, assume ¼-in. steel wire is to be reduced. With the first two mills, approximately 0.060 in. per pass is taken off. On the third mill the edging rolls edge the wire, while the turk's head on the fourth mill, operated after rolling, gages it for thickness and width, both the horizontal and vertical rolls being brought into play. The strains on the third and fourth mills are lighter than upon the first and second. By operating the mills in this manner the stock is held to a range, both in width and thickness, of 0.0005 in.

Where heavier mills are placed in tandem, the principle of operation is substantially the same, but on heavier stock it is generally customary to use only two mills in tandem, on account of the heavy strains that the large mills will take. Furthermore, on heavier mills flat stock is rolled, which naturally requires more frequent annealing on account of its size.

Another photograph illustrates a new rolling mill brought out to operate in tandem, having rolls 12 in. in diameter with 14 in. face. The roll journals in this case are 9 in. long and 9 in. in diameter. The ratio of the mill, including the motor train, is 19.6 to 1, and the roll speed 110 ft. per min. The motor used with



With Rolls 12 In. in Diameter and 14 In. Across Face, This Mill Weighs 35,000 Lb.; Its Motor, 3650 Lb. Additional

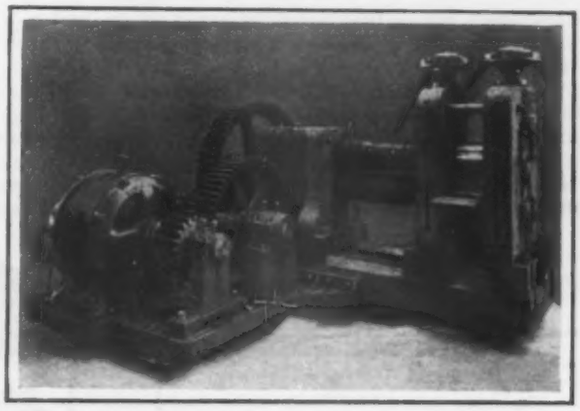
this mill is 100 hp., d.c., variable speed, shunt wound type, supplemented with automatic control, having 690 r.p.m. The mill occupies a floorspace 9 ft. 10 in. wide and 13 ft. 4 in. long, and stands 7 ft. 3 in. high. Without the motor, which weighs 3650 lb., the mill weighs 35,000 lb.

The last photograph shows a 10-in. mill operated in tandem, with rolls 10 in. long and 10 in. in diameter. The journals of this mill are 8 in. long and 8 in. in diameter. The ratio of the mill, including the motor train, is 14.6 to 1, and the roll speed, 124 ft. per min. The motor, a 75-hp., d.c., variable speed, shunt wound type, supplemented with automatic control, having 690 r.p.m., weighs 3100 lb. The weight of this mill, exclusive of the motor, is 12 tons. It occupies floorspace 9 ft. 5 in. wide and 11 ft. 4 in. long, and stands 6 ft. 8 in. high.

The design of these two heavier mills is substantially the same. The rolls are of forged steel, hardened and ground, and have independent adjustment upon each screw. The pinion housings are of forged steel of the herringbone type, operating in an oil bath. The motor and driving gears are of cast steel with maag cut teeth, while the pinions are of fabroil, steel faced, with maag cut teeth. The shaft bearings are of phosphor bronze and of the motor ring oiling type. The mills are very rigid in design, and are capable of maximum production at the speeds indicated.

In tandem rolling by the Standard method the electrical equipment constitutes a very important adjunct. It will be noted that the motors are direct current, variable speed, and that the roll speed on each mill naturally must synchronize with the first or original mill. Such is the case, and control is in the following manner:

A special rheostat and special control are provided each mill. When the stock passes from the first to the second mill, and from the second to the third, as well as from the third to the fourth, it passes through with a slight sag that is controlled by an ordinary dancer or



Mill and Motor Weighing 13½ Tons; the Rolls Are 10 In. in Diameter, with 10-In. Face

contact roll mounted between mills. This contact roll is connected to the control and automatically governs the speed of the motor, so that a proper momentum of material going through each mill is maintained.

The rheostat for controlling the speed of each mill to compensate for elongation constantly taking place need not necessarily be constantly manipulated. Push buttons provided at each mill, for stopping all mills, can be used to advantage in taking care of an occasional irregularity in the passage of stock through the rolls. These push buttons also insure safety to the operator. The rheostats merely regulate the ratio of the various speeds. The loop of wire between the mills has always been regulated by means of an improved vertical rheostat, which will control the speed of an entry mill. Incidentally it is advisable in this method of tandem rolling to operate the finishing mill at full predetermined speed, doing all fluctuating with the entry mill. By so operating, a full capacity mill production is assured.

Starting of the mills is done automatically, provision being made, first, for low voltage, to prevent self starting after stopping; second, gravity reset time limit with overload relay, to prevent overloading; and third, field accelerating relay, for high initial torque at low speed.

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The heating problem of large industrial plants is discussed in a pamphlet prepared for general distribution by the Grinnell Co. It is an engineering selling argument advancing five factors for consideration in heating costs, but emphasizing that as nowadays the fuel item is an important one, the economics of heating need consideration to an extent that did not obtain in the days of $1 and $2 coal. In short operating as well as first cost need an engineering analysis. A copy of the pamphlet may undoubtedly be obtained by addressing Harold S. Hall, of the company, Society for Savings Building, Cleveland.

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Weights of steel rounds, squares and hexagons, in lb. per ft., are given in a blue-printed wall chart issued by the Betz-Pierce Co., Cleveland. Rounds are covered from ⅛ in. to 6½ in.; squares, from 3/16 in. to 4 in.; hexagons, form 3/16 in. to 2¼ in. In all cases the metric size is given alongside its inch equivalent. Copies of this chart will be furnished by the company on request.

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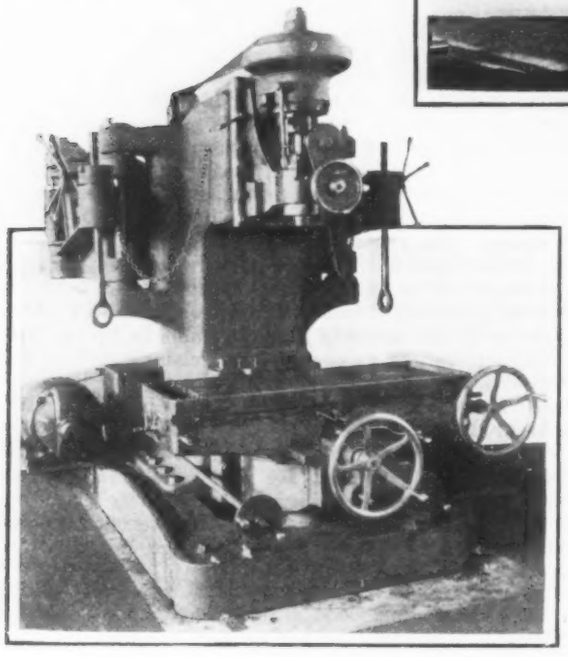
The Allegheny Steel Co., Brackenridge, Pa., has started up after a shutdown of several weeks. Three open-hearth furnaces are making steel preparatory to starting up 10 sheet mills, on Jan. 17, on a 4-day-a-week schedule.

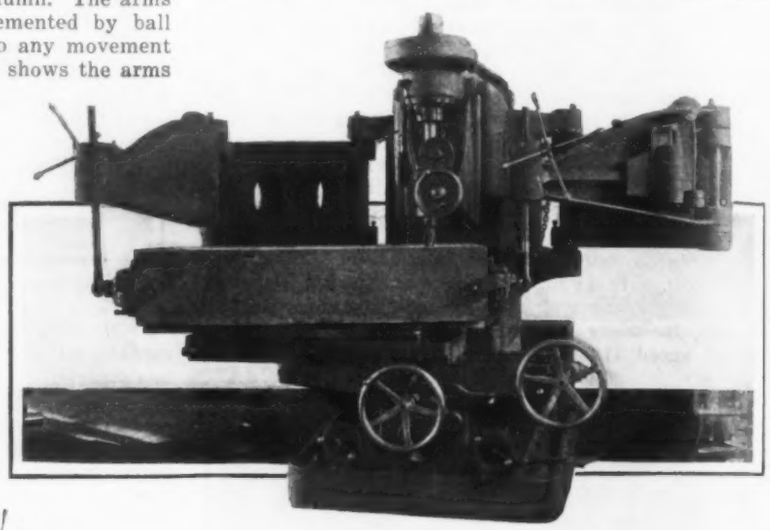
## Large Size Die Sinking Machine

A new die sinking machine with features particularly adapting it to handle large dies, has been placed on the market by the Pratt & Whitney Co., Hartford. In this design Bayrer's compensating arms are used, permitting dies up to four tons to be suspended by elevating screws and readily placed in position on the table and easily swiveled, tilted or turned on edge. The hand feeds are thereby rendered sensitive to light cuts and the die can be fed over to extreme limits for cutting gates without cramping.

In one of the accompanying illustrations of the machine the compensating arms are shown folded back and latched against the sides of the column. The arms are carried on roller bearings supplemented by ball bearings and are sensitive therefore to any movement of the die. The front view illustration shows the arms

Dies Up to 4 Tons May Be Placed in Position on the Table and Swiveled, Tilted or Turned on Edge. In the view below the arms are folded back and latched against the column, the view to the right showing arms extended supporting the die





extended supporting a die which is swiveled on the table and moved into position for a cut near the end of the die. Both of the outer carrying arms have balance beams and adjustable weights by which the load of the die can be approximately balanced and relieved from the table. Crabs attached to the ends of the die provide trunnions by which the die is supported, the trunnions furnishing the means of readily tipping the die on its side for edge cuts. When the die is being tipped in this way the table is dropped clear of the die, the arms sustaining the entire load.

The machine is of the knee type which permits elevating dies of various thicknesses to the proper height to bring the cut to a convenient level for the operator. To this end the range of the knee travel is kept unusually low down, and platforms are unnecessary. The cutter spindle is mounted in a counterweighted vertical head provided with hand feed, equipped with a graduated dial. Rapid traverse for the quick adjustment of the head is incorporated. Power to the cutter spindle is through a quarter-turn belt from the gear box in the rear of the machine and changes of speeds and feeds are made by levers at the front. Hand and power feed are provided for both the longitudinal and cross feed of the table, and in addition, all movements of the table including elevating and depressing have rapid-power movement. The mechanism driving the power movements operates through a friction to prevent injury to parts in case of over running. A cherrying attachment can be applied to the cutter head, the drive being effected through gearing to the nose of the cutter spindle. When not in use the cherrying attachment is swung back out of the way.

The machine is equipped for either a constant-speed drive direct from a line shaft or from a motor mounted on the machine. The table top is 22 by 48 in. The table feeds are, 48 in. longitudinal, 17 in. cross feed and 15 in. vertical feed. The cutter head vertical feed is 12 in. The floor space occupied is 10 by 10 ft. and the height of machine 9 ft. The weight is approximately 16,000 lb. The machine is also made without the die-carrying arms.

## Cost of Living in Five Cities

Only a moderate reduction is shown in the December figures of the Bureau of Labor Statistics, as compared with September, for the cost of living in New York, Chicago, Philadelphia, Detroit and Washington. Each city shows a slight decrease, the December average for the five being 74 per cent above December, 1914, while the September average was 77 per cent above the earlier date. In all but Detroit, the peak of housing cost or rental was in the current month, the average for the five showing 60 per cent above 1914. Food is listed as 50.5 per cent up; clothing as 95.3 per cent; fuel and light as 76 per cent; house furnishings as 117.3 per cent and miscellaneous items as 106.8 per cent above December, 1914.

## 1921 Exports of Industrial Machinery

Exports of American industrial machinery show an increase of some 170 per cent in value in 1921 over 1913, according to a special review of the machinery export situation by the Department of Commerce, in which figures for the first eleven months of 1921 ($238,007,585) are used to estimate the year's trade at $250,000,000. The impression that our foreign trade has collapsed is not justified, in so far as exports of machinery are concerned, says the industrial machinery division, in pointing out that exports of such machinery for all of 1913 were only $92,312,457.

The contract entered into by the Jones & Laughlin Steel Co. for the purchase of 900 acres of land at Hammond, Ind., provides that the sellers must make certain improvements to the property, among which is the dredging of the Indiana Harbor canal to make it navigable for ore carriers from Lake Michigan to the site of the proposed steel plant. The sellers must also provide drainage facilities, including a large sewer which it is reported will have a diameter of 16 ft.

## WAGES ADJUSTED

### Tonnage Rate for Sheet Mill Workers Advanced —Tin Mill Schedule Reduced

YOUNGSTOWN, OHIO, Jan. 17.—The bi-monthly examination of sales sheets Jan. 11 to determine the tonnage rate for sheet mill workers for the January-February period disclosed an average price on shipments of Nos. 26, 27 and 28 gage black sheets shipped during the 60-day period ending Dec. 31, of 2.80c. per lb. This represents an advance from 2.75c., the average at the settlement two months before. It is the first advance in the average price on shipments by mid-Western independent mills affiliated with the Western Sheet and Tin Plate Manufacturers' Association since the settlement covering the September-October, 920, period. At that time the average on Nos. 26, 27 and 28 gage shipments was 5.80c., representing the peak which the market attained. In the interim there has been a progressive decline at each bi-monthly examination, until the one just held.

The advance of 5c. per 100 lb. in the selling price, therefore, entitles affected employees to an increase of 1½ per cent in the tonnage rate, for each member of the crew. During January and February, sheet mill workers will be paid a rate 26 per cent above base, as compared with a rate of 109½ per cent above base when sheets were at their peak.

Average invoiced selling prices covering 1921 shipments by affected interests fluctuated as follows, according to the successive settlements: January-February, 4.30c.; March-April, 3.95c.; May-June, 3.85c.; July-August, 3.10c.; September-October, 2.75c., and November-December, 2.80c.

Tin mill workers, on the other hand, sustain a reduction of 3½ per cent in January and February, the average price of a box of 100-lb. coke tin plate primes being $4.80 on November-December shipments, compared with $5, disclosed at the settlement two months previous. Under the current rate, employees in tin mills are 19½ per cent above base. The peak tin plate price during the war of $8.40 was reached in the January-February, 1918, period, at the time when tin plate was in heavy demand for containers. Workers were then paid a rate which averaged 98 per cent above the base.

In 1921 the price of tin plate varied as follows: January-February, $7.15; March-April, $6.50; May-June, $5.95; July-August, $5; September-October, $5, and November-December, $4.80.

The last examination was conducted at Youngstown, James H. Nutt, secretary of the manufacturers' association, acting for the employers, while D. J. Davis of Pittsburgh, assistant to the president of the Amalgamated Association of Iron, Steel & Tin Workers, represented the employees.

## Proposed Transmission Line for Puget Sound Company

SAN FRANCISCO, Jan. 11.—The firm of Stone & Webster is considering the construction of a transmission line for the Puget Sound Light & Power Co. from Snoqualmie Falls, 36 miles east of Seattle, to the Wenatchee Valley, Wash., a distance of 110 miles. The local representative will leave in a few days for the North, when investigations will be started.

The line will be carried on steel towers and will be equivalent to No. 0 gage copper, stranded. It is expected that the current will be stepped-up at Snoqualmie Falls from the Falls plant, and from other plants owned and operated by the Puget Sound Light & Power Co., from 60,000 to 110,000 volts, and in the Wenatchee Valley will be stepped-down to various voltages, suitable for distribution. The plan of spacing has not been decided yet, but as it is in a mountainous region, will probably be variable, and generally speaking from 300 to 2000 ft.

The towers will be of extraordinary construction in order to carry the wires under heavy snow conditions in the Cascade Range. There has been no estimate of the amount of steel that will be required, but a very rough survey seems to indicate in the neighborhood of 2000 tons. This, however, depends whether the power line is for one circuit or two. The total copper requirement is said to be around 1,000,000 lb.

## Will Take Census of Safety Workers

Although it is known that the metalworking industry has, because of the inherent hazards of its nature, always been among the leaders in industrial safety, it has never been established definitely how many persons in the metalworking industry are engaged in accident prevention and industrial health work, or how this industry compares with other industries in this respect. All this will soon be shown when a census of safety men in the metalworking industry, which is now being taken by the National Safety Council along with the census of safety men in all other industries and in public safety work, is completed.

Following is the form which all safety workers are requested to fill in and send to the National Safety Council, 168 North Michigan Avenue, Chicago:

Name .....
Company or organization.....
City..... State.....
Nature of company's business.....
Is safety your principal work?.....
Please check other activities you engage in:

| | |
|---|---|
| Fire protection | Legal |
| Health and sanitation | Insurance |
| Workmen's compensation and claims | Welfare |
| General executive (such as manager or superintendent) | Educational |
| Engineering (other than safety) | Industrial relations |

How long have you been in your present position?.....
Technical or other special education?.....
Signed .....
Title .....

## Possible Postponement of Cleveland Foundry Exhibition

Some delay in arranging the details of the Cleveland Exhibition of the American Foundrymen's Association is necessary owing largely to the need of negotiations with the new Cleveland city administration in respect to settling on the special requirements of the foundry show to be held in the Public Hall, which is so new that it has not been opened to the public. It is likely that the exhibition will be delayed to the week of May 22 instead of the week of April 24.

The new Federal coal terminal at Mobile, Ala., is about completed and will be tested at an early date. It has cost $400,000 and has a capacity of 40,000 tons of coal and 20,000 tons of ore. Cargoes are deliverable from cars or river barges into bins or ships, and from ships into bins, cars, or barges. The terminals are expected to develop export and bunker coal business at Mobile in conjunction with Warrior River barge lines. Fuel oil storage bins were built last fall.

The Railway Supply & Mfg. Co., Cincinnati, has increased its capitalization from $10,000 to $600,000. The company is engaged in the railway supply business and has been operated as a part of the Joseph Joseph & Bros. Co. The company recently organized as a separate unit with the following officers: Arthur Joseph, president; Robert Orton, vice-president, and Wm. Ockrant, secretary and treasurer.

Fire destroyed the plant of the Standard Slag Co., at Sharpsville, Pa., Jan. 6, causing a loss of $75,000. The main building, 56 x 80 ft., was destroyed. The principal loss was occasioned by damage to the machinery. The company has its head office in Youngstown and had leased the building at Sharpsville from the Shenango Furnace Co. It is stated the plant will be rebuilt. The loss is partly covered by insurance.

The plant of Smith & Wesson, Springfield, Mass., firearms, which has been closed for several weeks, reopened Monday with a 20-per cent wage reduction.

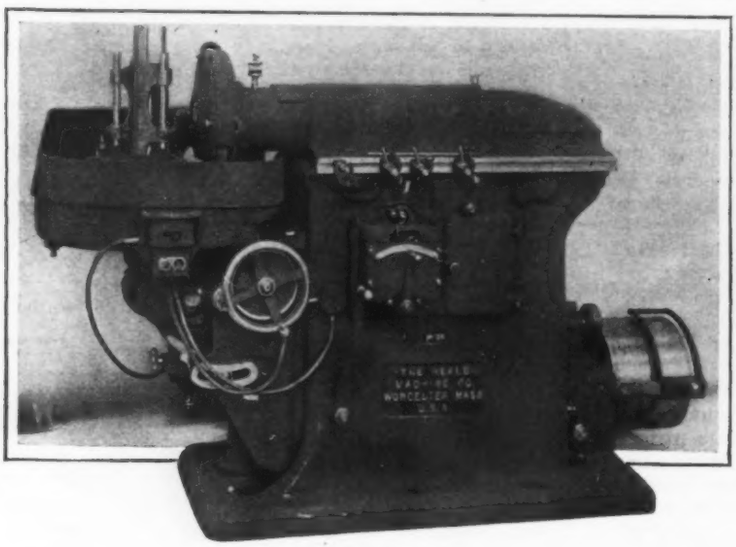
## New Heald Automatic Surface Grinder

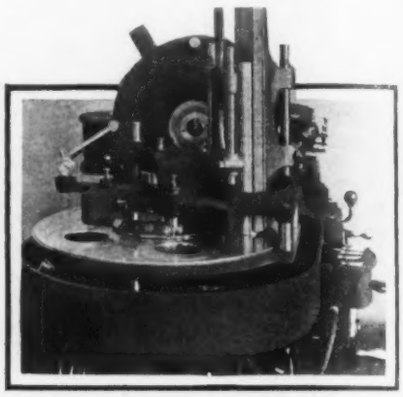
The Heald Machine Co., Worcester, has brought out a new automatic rotary surface grinding machine, known as the No. 25, designed particularly for quantity production in the grinding of piston rings, the sides of ball and roller bearing races, collars, washers, gears and similar work.

The machine is shown in the accompanying illustration. It weighs 4000 lb. net, the base casting alone weighing 1700 lb. and the wheel slide complete 700 lb. The wheel slide has wide flat and V-ways, and is liberally provided with oiling facilities. It is driven by an hydraulic arrangement operated by oil, and desired speeds can be instantly secured and the table reversed instantly without shock or noise. The reverse lever moves in the same direction that the wheel slide is desired to operate, and travel is allowed to travel beyond its regular reversing position, until it engages two dogs attached to the wheel slide, which reverses it the proper distance for truing the wheel. The movement of the dogs not only controls the wheel slide travel, but the action of the feeding device as well.

The machine is equipped with electric contact for furnishing current for the magnetic chuck when the rings are being ground and as the disk revolves, the current automatically is shut off an instant and reversed, demagnetizing the chuck. By the time the next piece of work is slid into place the current automatically is switched on again. An automatic vertical feed can be furnished as an extra, but it is not adaptable to a machine furnished with a ring feeding arrangement.

The machine can be equipped with 8-in., 12-in. or 16-in. Heald magnetic chucks. The 8-in. chuck, when





The Automatic Feed Is Used in Grinding Rings, Ball Races and Similar Work. The chuck is fed from a magazine. After the work has been ground it slides off the chuck

stopped by pulling the hand lever forward. The spindle is extra large and is of chrome vanadium steel. It is mounted in a straight plain adjustable bearing at the grinding wheel end and adjustment is made through an opening in the top of the wheel slide. No other adjustment is required, as the rear of the spindle is mounted on a self-alining ball bearing. A sight feed oiler provides oil for the plain bearing.

The main drive shaft is on the rear of the machine, and is mounted on extra heavy roller bearings. It has a two-step cone giving two speeds to the wheel, enabling the operator to maintain an efficient surface speed throughout the life of the wheel. The chuck spindle is mounted on ball bearings and driven by spiral gears. The spindle housing is tight, permitting the immersion of the bearings and gears in oil.

When the machine is used for general work without its automatic feeding device, the chuck bracket can be adjusted to allow for grinding concave and convex surfaces.

The patented automatic feeding arrangement provided is used when the machine is to grind rings, ball races, collars, washers, etc. The automatic features of this arrangement include a feeding plate with five holes bushed to take rings up to 5 in. in diameter. As the plate indexes, a ring slides from a magazine to the center of the chuck, is ground, and then slid from the chuck. The feeding plate is indexed by a lever connected with a crank disk at the back of the machine, operated by a friction device. The disk is held stationary by a latch while the wheel slide is going forward, grinding the ring on the chuck. The latch is tripped when the wheel slide returns, the crank makes one revolution, indexing the feeding plate from one hole to the next, and at the same time sliding off the ground ring and carrying a new one to the center of the chuck.

The diamond is located on the chuck pan and an arrangement provided for giving the proper stroke to the wheel slide in truing the wheel. By lifting a dog as the wheel slide is on the back stroke, the slide is used for rings, ball races, etc., with the automatic feeding device can handle work up to 2-in. thick. The chuck has a 7¼-in. vertical adjustment, and the distance from the top of the chuck to the center of the grinding wheel is 12 in. and 4¾ in. maximum and minimum respectively. In this arrangement the machine will not grind concave or convex. The 8-in. chuck, regular, on the other hand will grind concave and convex, has a face diameter of 9 in., a holding surface of 8 in., will swing 13 in. inside the water pan, has 8¼ in. vertical adjustment, a maximum distance from the top of the chuck to the center of the grinding wheel of 13 in. and a minimum of 4¾ in.

The 12-in. chuck has a holding surface of 12 in., a 13½-in. face diameter, a 16-in. swing inside the water pan, an 8¼-in. vertical adjustment, and a maximum distance from the top of the chuck to the center of the grinding wheel of 13 in. The machine in this case will grind concave 10 deg., and convex 15 deg. The 16-in. chuck has a holding surface of 16 in., an 18-in. face diameter, a 20-in. swing inside the water pan, a 7⅞-in. vertical adjustment, a maximum distance from the top of the chuck to the center of the grinding wheel of 12⅝ in., and a minimum distance of 4¾ in.

Water equipment, including pump, tank, water guard and connections are provided as extras. The machine is adapted for grinding wheels 14 in. in diameter by ¾ to 1½ in. face. For motor drive a 10 to 15-hp. motor is recommended according to the character of the work, furnishing speeds of 850 to 1200 r.p.m. The belt-driven machine requires 90 x 40 in. floor space.

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The *Illustrated Anchor Post* is a new monthly publication of the Anchor Post Iron Works, Garwood, N. J. It contains brief articles on electric welding in the making of railing and gates, flange welding, factory gates and illustrations of railing and gates made by the company. The publication is in charge of Rickard & Co., New York.

# German Pig Iron and Steel Production

## First Complete Data of the 1919 Production and Furnace Equipment—Estimates of the 1920 Output—Comparisons with 1913

*(Special Correspondence)*

BERLIN, GERMANY, Dec. 24. 1921.—No detailed statistics covering Germany's iron and steel production during 1920 and 1921 have been published as yet. While some headway has lately been made in bringing the foreign trade returns for the current year up to date, production statistics are still lagging sadly behind. This delay must primarily be attributed to the lack of personnel at the offices of the federal bureau of statistics during the years of the war as a result of which material has accumulated to an extraordinary extent. One may also not be far off the mark in assuming that military, political and economic exigencies in general are largely responsible for the marked reticence shown in publishing the latest returns. When it is considered that the returns are based on data, the furnishing of which constitutes a voluntary act on the part of the industry, and when it is further considered that mills are as a rule loath to divulge details concerning plant equipment and output and the different trade organizations are showing a similar reluctance to inform the public, the difficulties in the way of an efficient statistical service will be appreciated.

The latest returns on record cover the year 1919 which in many respects will go down as one of the most exceptional years in the annals of the German industry. War had just come to an end but peace not been concluded, the army was in a state of collapse and disintegration, and the entire industrial apparatus in the course of reconstruction. Raw material stores were depleted, the supply of raw products either impossible or rendered rather difficult, the people exhausted and important parts severed from the former empire. All these factors are characteristically reflected in the production returns which show a noteworthy decline in practically every department.

### Ore Mining and Consumption

Beginning with ore mining, the total tonnage of iron ore raised is given as 6,153,800 tons as compared with about 28,600,000 tons in 1913. Of blast furnace plants there were 69 with 232 furnaces toward the end of the year, the respective figures for 1918 and 1913 being 23 and 267, and 93 and 330. Consumption of iron ores and ferromanganese, including manganese ores with more than 30 per cent manganese, at the furnaces amounted to 10,592,000 tons as against 38,534,000 tons in 1913 and 18,048,000 tons in 1918. A feature of the ore supply was the notable relative increase of Scandinavian shipments and the heavy decline in the consumption of manganese ores.

### Pig Iron Production

Production of coke and charcoal pig iron totaled 5,650,000 tons, comparing with an output of 9,208,000 tons in 1918 and 16,760,000 tons in 1913. A detailed survey is given in the subjoined tabulation (in 1000 metric tons).

| Year | Foundry | Bessemer | Basic | Steel-making, Spiegeleisen | Puddled | Scrap from Washery | Total |
|---|---|---|---|---|---|---|---|
| 1919 | 1,872 | 61.0 | 2,594 | 1,521 | 105 | 1 | 5,654.0 |
| 1918 | 1,481 | 131.6 | 4,802 | 2,617 | 160 | 17 | 9,208.6 |
| 1913 | 5,380 | 375.0 | 9,868 | 2,551 | 464 | 27 | 16,765.0 |

### Iron and Steel Foundries

The number of plants decreased from 1,574 in 1913 to 1,469 in 1918 and 1,468 in 1919, the number of employees from 154,300 to 123,930 in 1918 but increased to 135,000 in 1919. Details of plant equipment are given below:

| Year | Cupolas | Reverberating Furnaces | Open-Hearth Furnaces | Crucible Furnaces | Electric Furnaces | Malleable Furnaces | Small Converters |
|---|---|---|---|---|---|---|---|
| 1919 | 2,914 | 104 | 145 | 983 | 13 | 800 | 140 |
| 1918 | 2,912 | 108 | 176 | 1,013 | 14 | 803 | 171 |
| 1913 | 2,979 | 110 | 102 | 1,402 | 3 | 659 | 60 |

Attention must be called to the fact that the 1918 returns include 112 plants whose production has been estimated only and on the 1917 basis; and that 91 plants did not furnish any data. Their aggregate output was estimated by experts to be 66,404 tons and the raw material consumption at 70,907 tons. These figures are not included in the following computation of consumption and production totals.

Consumption, including scrap, totaled 2,060,000 tons against 2,277,000 tons in 1918 and about 3,660,000 tons in 1913. It is interesting to note that foundries were largely adapted to the working of scrap and old material, the consumption of which during 1919 amounted to 809,679 tons, equal to about 90 per cent of the prewar consumption. This dependence on scrap was less marked in 1918, or 78 per cent, the respective figures being 1,459,000 tons and 1,118,000 tons. The production of foundries in 1919 was 1,820,000 tons as compared with 2,243,000 tons in 1918 and 3,340,000 tons in 1913.

### Wrought Iron

The number of plants and furnaces in existence at the end of the year were 16 and 153, respectively, (1918, 18 and 192; 1913, 31 and 326). The heavy decline of production in Upper Silesia compared with that of the Rhenish-Westphalian district forms a striking feature. The trend of developments is illustrated in the appended table in metric tons:

| | | Wrought Iron | | Refined and Converted Steel | |
|---|---|---|---|---|---|
| Year | Total | Rhen.-Westph. | Upper Silesia | Rhen.-Westph. | Upper Silesia |
| 1919 | 48,919 | 21,650 | 13,139 | 1,971 | 70 |
| 1913 | 212,203 | 62,443 | 67,947 | 946 | 938 |

### Steel Plants

At the end of 1919 there were 99 steel plants, while 108 were in existence in 1918 and 106 in 1913. The decrease in the means of production is shown in the tabulation below:

| | Converters | | Open-Hearth | Electric | Crucible |
|---|---|---|---|---|---|
| Year | Basic | Acid | Furnaces | Furnaces | Furnaces |
| 1919 | 64 | 15 | 451 | 38 | 71 |
| 1918 | 82 | 23 | 505 | 46 | 81 |
| 1913 | 109 | 13 | 432 | 27 | 116 |

Here again, scrap was extensively used, consumption of domestic pig representing but one third of the 1913 figures as is shown in the following in 1000 metric tons:

| | Pig Iron | | | |
|---|---|---|---|---|
| Year | Domestic | Foreign | Scrap | Iron Ores |
| 1919..... | 4,122 | 85 | 3,387 | 102 |
| 1918..... | 7,805 | | 5,252 | 178 |
| 1913..... | 13,282 | 45 | 5,579 | 297 |

The decrease is chiefly due to the cession of Alsace-Lorraine and the temporary elimination of the Saar district, the total production in Lorraine, the Palatinate and the Saar district amounting to 4,400,000 tons or 25.7 per cent of the German total. The total output for 1919 was 6,877,000 tons only against 11,829,600 tons in 1918.

### Rolling Mills

The number of plants in existence in 1913 declined

from 174 to 153 in 1919. The subjoined table shows the relation in the production of semi-finished material and finished products in metric tons:

| Year | Semi-Finished | Finished |
|---|---|---|
| 1919 | 1,132,000 | 5,230,000 |
| 1918 | 2,028,400 | 8,775,000 |
| 1913 | 2,958,000 | 13,119,000 |

**Estimates for 1920**

As already stated, no detailed returns for 1920 have been issued yet. According to a statement by the Verein Deutscher Eisen und Stahl Industrieller (Federation of German Iron and Steel Industries), 5,550,000 tons of pig iron and 7,710,000 tons of steel were produced in 1920. If these figures are correct, they would indicate a decline in iron output by 104,000 tons compared with the 1919 production (using the figures of the bureau of statistics for the comparison) and an increase in steel production of 978,000 tons over 1919.

A recapitulation of the production data expressed as a table is as follows:

| Year | Pig Iron | Steel Ingots and Castings |
|---|---|---|
| 1919 | 5,654,000 | 6,732,000 |
| 1918 | 9,208,600 | 14,072,000 |
| 1913 | 16,765,000 | 17,340,000 |
| *1920 | 5,550,000 | 7,710,000 |

*Not official.

These data cover Germany proper and evidently do not include Lorraine and Luxemburg.

# BELGIAN EXPORT PROSPECTS

## Despite British Competition Exports Increase—Cheaper Coke—More Furnaces Blown In

(*Special Correspondence*)

CHARLEROI, BELGIUM, Dec. 17.—Despite the decline in shipments to the United Kingdom and keener British competition, sentiment in the iron and steel market is improving as other foreign business increases. Producers have every reason to consider the future hopefully as, with the exception of wages, production costs are decreasing.

After several months of protracted deliberations between the Government and pig iron and coke producers, an agreement has been reached to reduce coke prices 15 fr. per ton. Further measures for lowering the price of coke are reported and another cut in coke prices in January is anticipated. Belgian and French collieries will probably be forced to make substantial cuts in coal quotations, as British exporters are now offering stocks, c.i.f. Charleroi, below the quotations of local collieries. Negotiations by the industry for a reduction of freight rates on export shipments have been pending for some time.

British competition in Continental markets is no longer confined to semi-finished material, but includes pig iron and bars. It is difficult to see how British producers can sell on the Continent at a profit, but it may be largely accounted for by the necessity of maintaining the position of British industry in world markets, even at a temporary loss.

In pig iron, Belgian exports have been placed at a disadvantage by the recent reduction in Cleveland iron, but the tone of the market is still strong. Active buying during the past few weeks has caused a scarcity of material, causing several plants to arrange for blowing in a number of blast furnaces.

The Thysle-Chateau works at Marcinelle is blowing in one of its blast furnaces which has been idle since last June. At Chatelineau one furnace will shortly be blown in. The Société Métallurgique de Sambre et Moselle is planning to start up one stack by January. Two furnaces have been relighted at the Ougrée and two at the Espérance Longdoz works. Furnaces are also ready to resume operation at La Louvière (Société Boel) and Monceau (Société Monceau-St. Fiacre).

Foundry iron No. 1 is quoted at 265 to 275 fr., No. 3 at 240 to 250 fr., basic at 235 to 245 fr. In semi-finished material the scarcity continues, as most of the output is being retained by the producers for their own consumption. Lorraine producers are averaging three months' delivery, while the terms of Luxemburg works for moderate tonnages are about 10 to 12 weeks. Sheet bars are quoted at 410 fr. per ton.

The upward trend of bar iron prices has been halted by the lowering of quotations in the United Kingdom and increasing competition in Holland, the latest quotations being 420 to 430 fr. for wrought iron bars No. 2, and 450 to 460 fr. for No. 3, while mild steel bars have been quoted at 455 to 465 fr., all for domestic delivery. Export prices for mild steel bars average 440 fr. The pipe and tube market shows a further improvement, but conditions in the wire and rail markets are less satisfactory. A decidedly stronger tone prevails in sheets, prices tending upward. Heavy sheets, basic, are quoted at 515 fr., medium sheets, basic, according to gage, 620 to 650 fr., and light plates about 840 fr. Steel hoops bring £11 to £11 10s., for export, f.o.b. Antwerp. Domestic prices for hoop iron are firm at 660 to 675 fr.

## British Pig Iron and Steel Output for December and for 1921

LONDON, ENGLAND, Jan. 13.

The production of pig iron in Great Britain in December was 275,000 gross tons and that of steel ingots and castings 381,000 tons. These compare with an output of 271,800 tons of pig iron and 442,800 tons of steel in November.

The production of pig iron and steel in Great Britain in 1921, as compared with 1920, according to National Federation of Iron & Steel Manufacturers, was as follows:

| | Pig Iron | | Steel Ingots and Castings | |
|---|---|---|---|---|
| | 1921 | 1920 | 1921 | 1920 |
| January | 642,100 | 665,000 | 493,400 | 754,000 |
| February | 463,600 | 645,000 | 483,500 | 798,000 |
| March | 386,000 | 699,000 | 359,100 | 840,000 |
| April | 60,300 | 671,000 | 70,600 | 794,000 |
| May | 13,600 | 738,000 | 5,700 | 846,000 |
| June | 800 | 726,000 | 2,700 | 845,000 |
| July | 10,200 | 750,600 | 117,200 | 789,900 |
| August | 94,200 | 752,400 | 434,100 | 709,200 |
| September | 158,300 | 741,000 | 429,300 | 884,700 |
| October | 235,500 | 533,200 | 405,400 | 544,300 |
| November | 271,800 | 403,200 | 442,800 | 505,100 |
| December | 275,000 | 682,500 | 381,000 | 746,600 |
| Total | 2,611,400 | 8,007,900 | 3,624,800 | 9,056,800 |

These data compare with 7,398,000 tons of pig iron and with 7,894,000 tons of steel ingots and castings in 1919.

The 1913 production was 10,260,000 tons of pig iron and 7,668,000 tons of steel ingots and castings.

## Will Sell Shell Steel

WASHINGTON, Jan. 17.—Bids will be received until Jan. 31, by the Ordnance Salvage Board of the War Department, at Chicago, on approximately 31,491 tons of shell forgings located at Columbus and Toledo, Ohio, and Savanna, Ill. The bids will be accepted on the total quantity of all three lots or the entire quantity of one or more lots. The forgings are rough and semi-finished and are said to be suitable for charging box scrap. They will be sold without regard to analysis of material, quality, quantity or condition.

The salvage officer at the arsenal at Rock Island, Ill., will receive bids until Jan. 27, for the sale of a large quantity of surplus building material at the arsenal. Included in the list of material are approximately 30,000 lb. of sheet lead of various dimensions; cast iron floor plates; structural steel; 36,000 bolts and nuts in various sizes; anchors and tie bolts; and over 20,000 lb. of railroad and boat spikes.

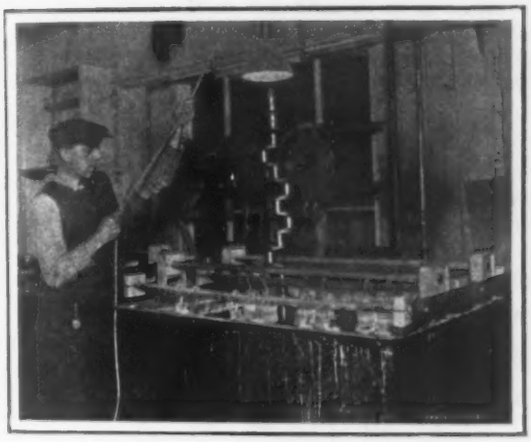
# CASE HARDENING A CRANKSHAFT

## Method Developed by Franklin Motor Car Co.—Only Wearing Surfaces Treated

In the case hardening of crankshafts as developed and put into a regular production proposition by the Franklin Motor Car Co., Syracuse, only the wearing surfaces are treated, the object being to secure harder surfaces for the main and throw bearings. The results from exhaustive tests are said to indicate that the wear of the case-hardened shaft is only one-sixth as much as on the company's former production crankshafts, tested under similar conditions. It is said that the life of the heat-treated bearings is three to four times greater than that of the soft crankshafts.

In the beginning of the process of case hardening, the wearing surfaces are wound with tape. The shaft is then dropped into a copper plating tank as shown, the copper protecting the exposed parts which

The Dipping of the Crankshaft into the Copper Plating Tank Is Shown Below. At the right the crankshaft is shown placed in the hardening die, or straight jacket, and being quenched. The hardening die serves to prevent distortion



are not to be hardened by preventing the penetration of the carbonizing gases.

The shaft is then packed into a box containing carbonizing material, each box accommodating three shafts. The box is sealed with fire clay and placed in the heating furnace where it is kept for 24 hr. at a temperature of between 1600 and 1700 deg. Fahr. The box is then removed and the crankshafts permitted to cool. They are then reheated to 1450 deg. Fahr., after which they are quickly placed into the hardening die, as illustrated, and then quenched. The hardening die, or "straight jacket," as it is called, holds the shaft rigidly, effectively preventing distortion.

After coming from the case-hardening room there are two grinding operations and a certain amount of aligning of the shaft to be done.

## Will Confer in Regard to Moving Pictures

WASHINGTON, Jan. 17.—Based upon responses received from industries and upon the activities of the Department of Commerce, which also has interested itself in the question, Nathan B. Williams, associate counsel of the National Association of Manufacturers, has made a report to President Edgerton recommending that the board of directors of the association invite manufacturers who have industrial motion pictures or who are interested in the subject, to a conference to consider the question of production and distribution methods now employed by manufacturers using motion pictures. The recommendation suggests the advisability of forming a joint agency of manufacturers under the auspices of the association, for the collection, production and distribution of industrial motion pictures. It is also suggested that a report be made on the plans and methods for carrying forward such a project if the conference should deem an undertaking of this character to be advisable, and that the Bureau of Foreign and Domestic Commerce be asked to participate in such a conference.

## Iron and Steel Production in Canada

The production of pig iron in Canada during November was fairly well maintained, the total output of basic iron amounting to 41,232 long tons as compared with 42,356 tons in October. With the exception of some 300 tons the whole output was produced by makers for their own further use. Foundry iron fell off slightly from 7217 long tons in October to 6348 tons in November, practically all of which was produced for sale. No malleable iron has been made in Canada since August, and no electric castings since September. The quantity of the last named commodity produced, however, is always small and is entirely the product of electric furnaces. No electric iron was made in either October or November, but contracts awarded for the manufacture of rails kept two furnaces in operation at Sault Ste. Marie, Ont., and two at Sydney, N. S., while the varied interests of the Steel Co. of Canada, Hamilton, Ont., permitted the operation of one blast furnace. These five furnaces, all of which were in blast at the beginning of the month, were the only units operating during the period under review.

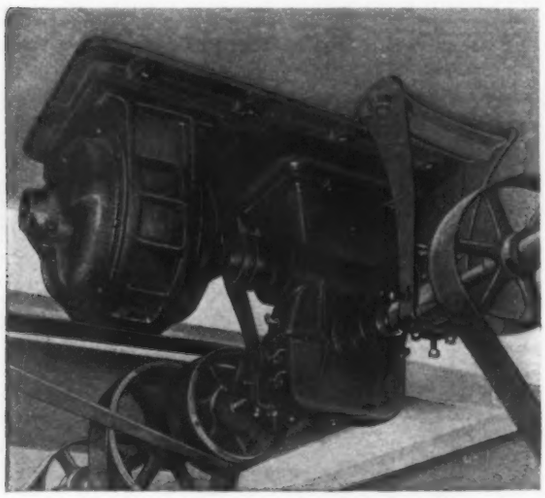
The output of ferroalloys showed a creditable increase from 1266 long tons in October to 1683 tons in November, in spite of the fact that only two plants were in operation. No spiegeleisen was made during the month, the output of ferroalloys consisting entirely of ferrosilicon in grades from 15 to 75 per cent.

The production of steel ingots and castings showed a decided improvement for November, the output rising from a high record of 72,204 long tons in October to a total of 75,039 long tons in the month of November. Of the November output 73,806 tons was made by the producers for their own use in the manufacture of steel rails. A small tonnage was produced for direct sale, the total under this item being 1233 long tons, practically all of which was in the form of steel castings.

The National Metal Trades Association will hold its twenty-fourth annual convention at the Hotel Astor, New York, on April 19 and 20.

## Worm Gear Drive for Line Shafting

Following the modern tendency to inclose all gears and other moving parts the Cleveland Worm & Gear Co., Cleveland, has developed the inclosed worm gear drive shown in the illustration, for the operation of line shafting with direct right-angle drive from the motor shaft through the worm and worm wheel to the line shaft. It is pointed out that this drive possesses various desirable features among the most important of which is that it permits the use of smaller, high-speed motors operating at 1800 r.p.m. and that not only is the first cost much less because of the use of smaller motors, but they have the added advantage of a higher power factor and higher efficiency which tend to give better starting conditions for the motor. The ease with which large ratios of reduction can be obtained with



Where Steel Girders Are of Sufficient Strength, the Unit Is Mounted on the Steel Work

the type of worm drive used, which is mounted on ball bearings, permits the use of this drive on high or low speed line shafts.

The drive runs in a bath of oil in an oiltight and dustproof housing, the case being filled with oil to the petcocks and about every three months drained, washed out and refilled with fresh oil. It is stated further that as there is no slip, the power being uniformly transmitted by the worm and wheel, the drive is a desirable one to use in manufacturing processes that require a constant application of torque. The drive operates with practically no vibration or noise and may be mounted with the motor on a cast-iron bed plate attached to the ceiling as shown in the illustration. Where the steel girders are of sufficient strength, the unit may be mounted directly on the steel work.

The efficiency of this drive is stated to be approximately from 93 to 97 per cent, depending upon the ratio of reduction. The unit stresses are kept at a minimum to insure long life with practically no interruption of service. The necessity of shutdowns because of broken driving belts or chain is eliminated. As the drive is totally inclosed, no guards are required to cover moving parts nor is it necessary to make adjustments for wear.

## Safety Meetings for Carnegie Plants

A course of safety lectures for the instruction of the workmen of the Edgar Thomson Works, Carnegie Steel Co., and other plants in the Braddock, Pa., district, has been arranged by the safety organization of the Edgar Thomson Works, O. J. H. Hartsuff, general superintendent. Last fall a series of safety lectures for the foremen of the district was conducted by the Braddock plants. The current course for the education of workmen is modeled after the successful course that preceded it. At each session, in addition to the speaker, music is furnished by organizations from the local steel plants, supplemented by readings and musical performances by volunteers from the district. Several playlets are now being rehearsed in which employees of local mills will enact scenes from everyday life in the steel mills which carry a lesson in safety to the audience. John B. Trusel, safety director of the Edgar Thomson Works, is chairman of the committee arranging the course. The first session was held Thursday evening, Jan. 12, with an address by John A. Oertel, safety director of the Carnegie Steel Co. E. S. Willis, who conducted the safety course held for the foremen last fall is in charge of the present course.

## First Sectional Meeting of the American Society for Steel Treating

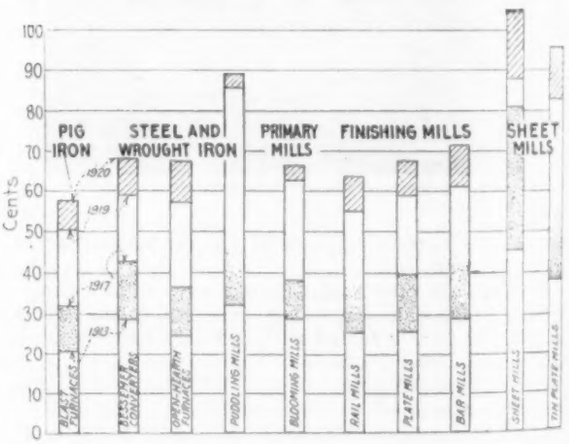
The first of two sectional meetings of the American Society for Steel Treating, to be held in 1922, is scheduled for March 3 in New York, under the auspices of the New York Chapter. The meeting is to embrace the members of all the chapters in the eastern territory, including Syracuse, N. Y., and Washington.

The meeting is distinctly a technical one, at which six papers on various heat treatment subjects are to be presented by members of the various chapters. These are to be pre-printed and an extended discussion is aimed at. The papers are to be presented at an afternoon and evening session. An informal dinner is scheduled.

The second meeting of this nature is to be held in Pittsburgh some time in May. At both meetings an invitation is to be extended to the members of other technical societies in the vicinity, urging their attendance and participation in the discussions. The program for the March meeting will be available soon.

## Wages in Iron and Steel Plants

In the chart, the average earnings of all employees in each of the ten departments mentioned are shown separately for 1920, 1919, 1917 and 1913, except that




the 1917 figures for puddling mills, rail mills, bar mills and tin plate mills are missing. The top of each column represents the average 1920 hourly earning; the bottom of the upper shaded section shows the earning for 1919; the top of the lower shaded section, that for 1917, and the bottom of the lower shaded section, that for 1913, as indicated at the left. From this it will be easy to compare department with department at any given date.

This chart was inadvertently omitted from page 156, THE IRON AGE, Jan. 12, where some of the detailed figures are given on which the chart is based.

The Philadelphia Foundrymen's Association, at its annual meeting, Jan. 10., re-elected Thomas Devlin of the Thomas Devlin Mfg. Co., president. R. C. Spare, American Manganese Bronze Co., was elected vice-president, succeeding George C. Davies of Pilling & Co., pig iron merchants. Howard Evans of the J. W. Paxson Co., was re-elected secretary and the same executive committee will serve for another year.

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ESTABLISHED 1855

# THE IRON AGE

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## The Future of the Trade Associations

Unexpectedly small concern is shown over the right of the so-called open price trade associations to exist. Their members commonly believe they have kept in the right path, but they are disposed to question the present need of association activities. This view grows out of the mood which raises an interrogation on every expenditure. The uncertainty created by the so-called hardwood decision of the Supreme Court gives the cue to the member for chopping off the association assessment. Only a portion of the members recognize in times like these the value of definitely discovering signs of a turn in the consumption as well as in the production trend and of checking the shrewd moves of opportunist buyers. The average manufacturer is an average man and he finds it hard to take from his surplus or to extend his credit when there is little promise of early reward. Thus the association is weakened financially and its activities crippled.

That organizations of competing manufacturers have been studiedly innocuous, since the first finding against the now famous hardwood association nearly two years ago, has not made for tight bonds of membership. The business depression, too, has caused many to forget what the associations have accomplished. Legal advice, as always, has been a safeguard, but the close decision of the Supreme Court in the hardwood case has shaken confidence in the opinions of legal advisers.

It remains that the association members do not care to test their contentions of entirely legal conduct by being parties to a Government suit. The attitude, as stated, is one influenced largely by the lean pocketbook. It shows the distorted perspective in which many view their problems in the depths of a depression. The result may be the cessation of practices close to the border line, even though many of the benefits of the past be given up. Thus small associations may find it difficult to retain a sufficiently large percentage of the industrial or trade group to make the association properly efficient or influential, and industry generally will be the loser.

It is yet to be seen how far the abandoning of associations will check Government efforts to help business, as through the Department of Commerce. Before long a clear pronouncement may be expected. The Chamber of Commerce of the United States has made a good move in starting a special investigation. Meanwhile, it behooves the trade associations to go slowly in taking steps to disband and thus destroy a usefulness which it has taken long, hard work to build and maintain.

## Steel Demand for Replacements

In September, 1918, the rate of steel ingot production in the United States was approximately 47,000,000 tons a year. In March, 1920, a rate of 45,000,000 tons was attained. One of these high points was reached during the war, the other more than a year after hostilities ended. Last July the rate was approximately 11,000,000 tons. At the beginning of last November it was probably not far from 25,000,000 tons. Never before in the history of the steel industry were there such wide swings in the operating rate, and the present seems like a strange time in which to suggest that in future years the production of steel is likely to be at a steadier rate than used to obtain, yet there is some reason to suppose that the steel trade is approaching a period in which demand and production will run along more uniformly than has been the average experience in the history to date.

The swing in production down and back in 1921 was based on circumstances quite unlikely to be repeated. Late in 1920 and early in 1921 stocks of steel and of various manufactures of steel piled up because men did not realize suddenly enough the extent of the readjustment that had begun. The liquidation of these stocks was the chief cause of the special dip in the rate of steel production last summer, the production at that time being no measure of the then current rate of consumption. This dip, therefore, may be disregarded, and we should consider that recent experience was of consumption being reduced only by one-half, not by three-quarters.

Leonard P. Ayres, vice-president of the Cleveland Trust Co., has made a careful study of the automobile trade. By taking the production of

passenger vehicles and dividing it into Fords and "all other" he has seen a point which the superficial observer, glancing simply at tables showing "the production of automobiles" has missed. Mr. Ayres finds that the production of "all other" increased rapidly up to and including the year 1916, and that since then the production has increased but slightly. The spread of the automobile has been downward into the ranges of smaller purses, and the production of the Ford car doubled from 1916 to 1920. Mr. Ayres reaches the conclusion that it is a practical working rule to assume that the life of an automobile is six years and that without expansion in the use of the automobile one can count upon a demand in a given year equal to the production of six years earlier.

This is precisely the sort of rule the steel trade has been wishing it had for each class of steel consumption. Even a few such rules, applicable to some of the important classes of steel consumption, would prove very helpful. For instance, in every one of the three years, 1905, 1906 and 1907, more freight cars were built than in any preceding or subsequent year. A large part of that work was in the building of steel cars to replace wooden cars. If steel cars had a definite and uniform life we would know when to look for replacement orders.

While it may not be possible to formulate such rules, one can generalize to the extent of saying that as the total amount of steel in service grows the average annual replacement requirements must grow. As an index the statistics of pig iron production are, of course, better than the statistics of steel production. At the beginning of 1882, 1892, 1902 and 1912, the condition was in each case that of all the pig iron that had been made up to that time approximately one-half had been made in the preceding ten years. That is an index to the newness of the store of iron and steel in use at any date in the period. Up to the beginning of 1912 about 440,000,000 tons of pig iron was made, but in the past ten years the production, minus the equivalent represented in regular exports and our own war material sent abroad, was hardly more than 270,000,000 tons. Instead of equaling 440,000,000 tons, it was only about 60 per cent of that amount. Thus the average age of the material we now have in service is considerably greater than in the other periods named, and we are at a time when the ratio of replacement demand to expansion demand is decidedly higher than formerly.

## Fighting by Injunction

A very unusual if not unprecedented decision was given a few days ago in the Supreme Court in New York by Justice Robert F. Wagner, who held that the Cloak, Suit and Shirt Manufacturers' Protective Association was guilty of breaking a contract in attempting to establish piece work and the 49-hour week in the shops of its members. He permanently enjoined the association from pursuing what he finds is a conspiracy. Although an officer of the union hailed the decision with delight and announced that the employers would be sued for an amount "running into the millions" on account of wages lost since the strike was declared last November, some of the union men are not at all satisfied with the victory and one of their attorneys asserted that he was by no means converted to the opinion that court injunctions are the proper method of adjusting industrial disputes.

Certainly it must be conceded that if the contending sides in a strike fight each other by injuctions, it is better than to resort to violence which so often has been the labor union's method of securing its ends. In fact, the decision seems to put the participants on a higher plane and might suggest a further argument for incorporation of unions so that decisions could be more easily and effectually enforced. As the court said, "the fact that the employees entered equity's doors by a hitherto untraveled path" does not lessen their right to the law's decree. They are placed in the position of respecting courts and injunctions and that is an unusual attitude for many of the labor agitators.

In the last analysis the issue comes down to a matter of fact. If the employers in any case violate a contract, they ought to be held responsible, just as the employees should always be held responsible for any contract which they have made. If labor leaders are compelled to give up their defiance of the courts and take their chances when they submit disputes to legal decisions, there will be reason for believing that real headway has been made on a problem on which there has been so much traveling in a circle.

## Labor's Share in Steel

Although the rapid progress of events has made the census figures for manufactures of 1919 decidedly out of date, yet some interesting deductions are to be drawn from the relations between those figures, some of which are not yet published, and corresponding figures for 1914, the previous census year. These deductions, which do not appear on the face of the returns as put out by the census bureau, follow a close and discriminating analysis of those returns.

Taking the figures for blast furnace plants, steel works, rolling mills and pipe mills, covering a total of 745 establishments in 1919, it is found that the total outlay for wages and salaries in that year was 22.72 per cent of the entire value of products made, as compared with 20.53 per cent in 1914. The element of prices is evaluated here, because both the wage bill and the products are quoted each year, in terms of the same dollar. It is thus evident that labor's share during that interval increased by something more than 10 per cent. Putting this in another way, the wages paid in 1919 amounted to 37.07 per cent of the value of the materials upon which labor, purchased by those wages, was expended. This compares with only 29.41 per cent in 1914, and shows that, in spite of the heavy increase in the cost of materials purchased, the wages of labor far outstripped it.

It has become common practice of late for self-

appointed economists, arguing in favor of labor unions, to point accusing fingers at the high salaries paid the directing minds of large enterprises. In the case of the steel mill units above mentioned, salaries in 1914 amounted to 20.71 per cent of the wage payments; in 1919 the proportion was only 16 per cent. This shows that, although the salary list has been heavily augmented, it is relatively much smaller than the wage list, when compared with operations of earlier days. From whatever angle it is considered, therefore, it is apparent that the wage earner has been getting his full share (and somewhat more) of the output of the steel industry.

## Making Transportation Adequate

While many things are essential in making the foundation upon which a people may be prosperous and make progress, it is obvious that the two most important requisites are a sound medium of exchange and good transportation facilities. In all the analyses that have been made of the poor economic conditions in Europe two points have been emphasized—the absence of sound currencies and the absence of adequate transportation facilities. Conditions vary greatly in different parts of Europe, yet whatever the situation these two desiderata for improvement are conspicuous.

In the United States we have one of these two requisites, an admirably sound currency. In transportation we have something of doubtful adequacy, there being quite a range of opinion as to how poor or how good the rail transportation situation is.

The variation in opinion is due to an extent to differences in the viewpoints of individuals, but largely it is due to failure to form definite conclusions as to the quantity and quality of the rail transportation the nation requires. There has been very little quantitative or qualitative analysis of the transportation service the railroads have furnished from time to time in relation to the volume of business activity in the various lines of industry.

Let us illustrate this suggestion that rail transportation should be studied in connection with industrial activity: The iron and steel industry would like to operate at a rate involving a production of 40,000,000 or 50,000,000 gross tons of ingots a year. The bituminous coal industry would like to produce 600,000,000 tons a year. The building trades would like to see a million or so of dwelling houses built in a couple of years. Motorists and others would like to see tens of thousands of miles of improved roads built. We go on thinking and hoping that these things can and will be done, but there is nothing like careful analysis and study to determine whether the best transportation service we can expect from present facilities would permit of their being done. If they cannot be done and we should become all set for the accomplishment, we should simply run into disappointment by what we have experienced before, called a "breakdown in transportation."

It is not logical to set our minds on high standards of performance in industry, such as those cited, without making sure that we have the requisite transportation facilities. It is plain that we have not. In 1920, with vexatious delays to shippers and heavy losses to industry from poor transportation, the railroads made their highest record in freight movement, 448,500,000,000 ton-miles. That was the maximum in quantity of service, but the quality of service was very poor, certainly not the quality shippers want. Yet 1920 was not a year of great industrial activity. It was a year of high prices due to difficulties in producing goods and securing delivery of goods and to profiteering and speculation. For nine months the steel mills, importuned by customers for heavier shipments, had their operations curtailed by 20 per cent, chiefly from lack of transportation. The coal and coke produced was far under the capacity, yet prices were outrageously high because transportation was insufficient. Road and dwelling house construction was far below what the people expect and want in future. Yet in 1920 there was not enough transportation capacity to furnish good service for the restricted amount of industrial activity in that year.

We now have logically but two choices. We must either renounce the hopes we have been entertaining of there being great industrial activity in future or we must become willing to do the work and spend the money necessary to establish the needed transportation facilities.

# CORRESPONDENCE

## Split Blast Furnace Shafts

*To the Editor:* The editorial entitled "Split Furnace Shafts," which appears on page 166 of your issue of Jan. 12, the writer has read with a great deal of interest. It furnishes us with information which apparently is not generally known.

The view you have taken that the splitting of the shells is not so much due to the fire brick as to the accumulation of metallic zinc, also zinc oxide on the brick and penetrating it, seems entirely reasonable. The remedy which you point to, viz., using heavier plates and banding the furnace, seems to me, however, only changing the effect of the expansion from one point to another. This suggestion which you make will without doubt save the shell, but on the other hand will ruin the fire brick.

The great amount of pressure which is brought to bear on account of the expansion, when the plates will not give, will cause the brick to spall off, starting on the inside. It is a well-known fact that it is next to impossible to convince any one handling a furnace, regardless of the kind, to lay the blame for spalling to anything but inferior fire brick. Therefore, your remedy does not cure, but merely relieves the afflicted part.

I would like to offer a suggestion in conjunction with that made by yourselves, not only to strengthen the shell of the furnace but to make it perhaps a trifle larger in diameter—the amount to be determined upon by those who are able to figure these matters—and between the brickwork and the shell to make a cushion of dry quicksand. With such an arrangement, when the bricks expand, they would exert the pressure against the sand rather than the shell. The shell will be practically immovable. The sand on the other hand will flow when pressure is brought to bear, and the horizontal expansion of fire brick would be taken up

ing the vertical movement of the sand, provided there is provision made at the top of the furnace to take the sand forced up by this expansion. It might be that sharp sand would do as well as the quicksand. The reason that quicksand is suggested is that there is a better chance of its moving and allowing for the necessary expansion.

My interest in this matter is readily understood by yourselves on account of my connection with the fire brick industry.

JOSEPH PODMORE,
Secretary Ostrander Fire Brick Co.

Ostrander, N. Y., Jan. 13.

## BIDS ON VESSELS

### Much Interest Manifested in the Proceedings at Washington

WASHINGTON, Jan. 17.—With 17 concerns from the various sections of the United States submitting bids on obsolete naval vessels at the opening here yesterday, the interest created was even greater than had been expected. What it may indicate as to the proposed establishing of a ship salvaging industry in the country remains to be seen, but naval officials professed to see in the bidding good prospects for the creating of such an industry provided the scrapping of ships is undertaken on a broad scale as the result of the action of the Conference on the Limitation of Armaments and the maintenance of an adequate American merchant marine. While some bidders undoubtedly do not intend to engage permanently in the salvaging business, others apparently are ready to do so, while still others already have been so engaged to differing degrees in the work. The vessels for which bids were submitted included three battleships, two cruisers and four monitors. The battleships are the Maine, Missouri and Wisconsin, the cruisers the Columbia and Memphis and the monitors, the Ozark, Puritan, Tonopah and Miantanomoh.

Among the most prominent bids were the following:

| Bidder | Vessels Bid On | Bids (Cents Omitted) |
|---|---|---|
| Henry A. Hitner's Sons Co., Philadelphia | All or none | $235,000 |
| Pacific Industrial Co., Seattle, Wash. | All or none | 213,013 |
| *Merrit, Chapman Derrick & Wrecking Co., New York | Maine | 25,194 |
| *Merrit, Chapman Derrick & Wrecking Co., New York | Missouri | 25,194 |
| *Merrit, Chapman Derrick & Wrecking Co., New York | Wisconsin | 23,094 |
| John Kanzler & Sons, Bay City, Mich. | Missouri | 26,700 |
| John Kanzler & Sons, Bay City, Mich. | Wisconsin | 22,600 |
| Robert McGregor, New York | Maine and Missouri, each | 37,777 |
| Boston Iron & Metal Co., Baltimore. | Columbia | 51,265 |
| Newport News Shipbuilding & Dry Dock Co. | Missouri | 15,000 |

*Bids do not include 22 plates of armor weighing 506 tons which are to come off of each ship.

The Kanzler bids provide for removal of armor by the Government.

Other bidders were: The F. J. Lewis Mfg. Co., Chicago; William F. Callahan, Boston; F. J. Lucius, New York; Irvin A. Taylor, Oakland, Cal.; J. L. Barnard, Baltimore; A. H. McDonald, Washington; John S. Turner, Newburyport, Mass.; A. H. Roberts, Denver.

The bids are to be submitted by the Board of Survey, Appraisal and Sale to the Division of Operations, Navy Department, and final decision as to making awards rests with the Secretary of the Navy.

The Hyman-Michaels Co., Chicago, submitted a proposal to bring from England an official of a large wrecking company to organize, finance and operate a company in this country.

---

Hickman, Williams & Co., brokers, Chicago, have opened a storage yard at West Pullman, Ill., for the purpose of storing the various commodities they handle, including pig iron, ferroalloys and scrap. The yard is 300 x 600 ft. and is served by a locomotive crane. It is situated on the Chicago, West Pullman & Southern Railroad at 119th Street and Ashland Avenue.

## OPEN PRICE POLICY

### Government Will Issue a Statement in Regard to Hardwood Decision

WASHINGTON, Jan. 17.—It finally has been definitely determined by the Government to issue a statement regarding practices of open price associations. This proposal, which originally had been planned and which trade associations have been urging with increasing persistence since the decision of the Supreme Court in the Hardwood case, still is the subject of conference between Attorney General Daugherty, Secretary of Commerce Hoover and members of the Federal Trade Commission. Attorney General Daugherty this afternoon said that he has prepared a tentative draft outlining the attitude of the Government toward practices of trade associations with the expectation of making it public soon. This follows on the heels of the understanding that the Department of Justice had concluded not to issue the statement.

While the character of the statement to be given out is not known, it is believed that it will be scrupulously drafted so as not to cause any conflict with cases before courts or that may come before them bearing on trade association activities. It was stated by the attorney general that the Department of Justice wil give its judgment to show how far such associations may go and to provide a guide for them as far as possible. The department, it was declared, desires to encourage lawful associations both by reason of constructive work they may do for the trades they represent and through co-operation with the Department of Commerce. It is the purpose of the Department of Justice to see that Government officials coming in contact with trade associations are profound in the law and also to see to it that "no ground is cut from under the Department of Justice." Intimation was made that violators of the law would be pleased to see a statement from the Department of Justice which they could use in shielding themselves in case of prosecutions. The department evidently is going to be cautious so as to avoid such a circumstance. At the same time, it was made known that a statement coming from the department is not binding and would not hold if a court should hold against its principles and such holding were affirmed by the higher court.

One outstanding benefit of such a statement, it was indicated, would be to assure continued co-operation between the Department of Commerce and trade associations, which has been lessened somewhat since the Hardwood decision. Another advantage, it was declared, might be to decrease the number of investigations of trade association activities by the Federal Trade Commission and make contemplated investigations unnecessary.

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### Date for Basing Point Hearing

WASHINGTON, Jan. 17.—The Federal Trade Commission has definitely set Jan. 30 as the date to begin hearings in the Pittsburgh base case and this date has been accepted by the United States Steel Corporation, the respondent. Hearings are to begin in Milwaukee and it is probable that the proceedings will be transferred to Minneapolis as the second point.

### The Tribute to Steel Reprinted

Many letters have come to us asking for copies of the tribute to steel, by Henry D. Hubbard, of the Bureau of Standards at Washington, which was strikingly displayed on pages 20 and 21 of our Annual Review Number of Jan. 5. Arrangements have been made for a special reproduction of these pages on India coated paper and an extra copy will be sent to any IRON AGE reader requesting it.

# SHAPING THE TARIFF

### Senate Committee Agrees on Valuation Bases — Studying Smoot Amendment

WASHINGTON, Jan. 17.—The agreement of the Senate Committee on Finance tentatively determining to base the ad valorem import duties in the permanent tariff bill on the basis of the wholesale selling price in the United States is in harmony with the report published in THE IRON AGE of last week. The proposal is said to have the endorsement of the Treasury Department and the Tariff Commission. The duties would be based on the prices in the domestic market prevailing at the time of shipment of the imports. Details of the plan, together with other questions, are still being discussed by the Finance Committee with Treasury Department experts and members of the Tariff Commission. The plan is provided in an amendment offered by Senator Smoot. Chairman McCumber of the committee hopes to announce a definite agreement within a day or so, he said. The plan to assess duties is similar to that which was originally suggested to the House Committee on Ways and Means, which finally adopted, and had the House pass the strictly American valuation plan fixing duties on the basis of the wholesale American market of American products comparable to foreign products.

The committee is making a study of the Smoot amendment, which deals with several important features of the tariff question. One of the principal sections would authorize the President to exclude products of countries which discriminate against the commerce of the United States and is more drastic than previous provisions which have been suggested to deal with this problem. The Smoot amendment fixes the maximum of the new or additional duties which the President would be empowered to impose in retaliation for discrimination at 250 per cent ad valorem or its equivalent. Other amendments by Senator Smoot would provide for an elastic tariff, giving the President discretionary authority to make it effective. The fact that the amendments have the indorsement of Commissioners Marvin and Burgess of the Tariff Commission and Judge Marion Devries, presiding justice of the United States Court of Customs Appeals, indicates that the Administration stands back of the Smoot proposal. Senator Watson of Indiana, prominent member of the finance committee, and other senators, have endorsed the amendments.

The report on the steel section of the tariff bill as it relates to the assessment of duties on the American valuation basis is expected to be submitted to the committee some time this week. It covers reports made by domestic steel manufacturers as well as data taken from the books of importers showing prices of domestic steel products and of imported steel as well as profits made by importers.

## Encouraging Results of Conferences of Railroad Executives and Brotherhoods

WASHINGTON, Jan. 17.—Efforts to adjust differences betweeen railroad executives and employees and to prevent a possible strike appear to be bearing fruit. Negotiations to this end still are in a preliminary state and it necessarily is not possible to say what the ultimate outcome may be. The conference held yesterday by Secretary of Commerce Hoover with railroad executives and representatives of the four railroad brotherhoods resulted in a provisional agreement to submit wage and working questions affecting train service employees to regional conferences for adjustments without making it necessary to take the questions up before the Railroad Labor Board.

Conferences are to take place as near Feb. 10 as practicable, according to a statement by Secretary Hoover. It was declared that the sole discussion was upon the practicability of re-establishing the pre-war regional conferences in order to facilitate the work of the Railroad Labor Board and above all to create a spirit of working good will by adjustment instead of litigation. A meeting of the railroad executives has been called for Saturday at Chicago. Secretary Hoover said that the conference did not discuss wages and working agreements in themselves and stated that he considered the railroad labor situation as entirely disconnected from negotiations over coal mining wages.

Notice has been given formally by the railroads to the labor board and the organization of railroad employees that general reductions in existing wage schedules will be asked. The Administration is also making active efforts through negotiations with President John L. Lewis of the United Mine Workers of America to prevent trouble in the industry. The miners' union is endeavoring to prevent the reduction in wages proposed by coal operators after expiration of the existing wage contract of April 1.

## No Competition Between Steel Corporation's Ships and Rail Lines

WASHINGTON, Jan. 17.—Subsidiary railroads of the United States Steel Corporation do not and may not compete with the steamship lines of the United States Steel Products Co. operating through the Panama Canal and the Interstate Commerce Commission should enter an appropriate order to this effect, according to a tentative report of Examiner Burton Fuller made public yesterday. His recommendation, if adopted, would mean reaffirmation by the commission of its holding previously made that the Steel Corporation subsidiary rail lines "do not and may not compete" with the steamship lines of the Products company operating through the canal.

The case was reopened by the commission on June 22, 1921, for further hearing in order to ascertain whether conditions with respect to competition between the applicant railroads and the steamship lines of the Products company operating through the canal had so changed since the issuance of the original report as to make the continued operation of such steamship lines by the Products company a violation of the act.

## British Industries Fair

The British Industries Fair will be held at Birmingham and London Feb. 27 to Mar. 10. The centralized exhibit of British-made merchandise will be divided into two sections.

The Birmingham section will include displays of brasswork; hardware; ironmongery; metals; construction and building materials; power; lighting and heating equipment; ventilating; engineering; agriculture: mining equipment; motors; guns, etc.

The exhibits at London will embrace musical instruments; cutlery; scientific goods; photographic goods; drugs and chemicals; glassware; toys; jewelry; silverware and other manufactures.

Information regarding the fair can be obtained from the British Consulate or Trade Commissioner, 44 Whitehall Street, New York.

## Dayton Malleable Iron Co. Buys Plant

The Dayton Malleable Iron Co., Dayton, Ohio, has purchased the Canton, Ohio, plant of the Timken-Detroit Axle Co., Detroit. This is a malleable iron foundry which has been used by the Detroit company for making automobile castings. It is stated that the Dayton company will operate it as a railroad specialty shop. The transfer of ownership will take place Feb. 1.

## Testing Materials Meeting

The twenty-fifth annual meeting of the American Society for Testing Materials will be held on June 26 to July 1 inclusive at Atlantic City, N. J., with headquarters at Chalfonte-Haddon Hall Hotel.

## OPEN PRICE COMPETITION

### Plan of Knitgoods Manufacturers Expected to Provide a New Test Case

WASHINGTON, Jan. 17.— Considerable speculation exists as to the attitude of the Department of Justice toward the establishment of an "open-price" plan by the National Association of Hosiery and Underwear Manufacturers, despite the decision of the United States Supreme Court in the Memphis Hardwood case. It is expected that the establishment and actual operation of the plan will bring about a test case which, if carried to the highest tribunal, will develop an amplification of its decision in the Hardwood case. Attorneys who have followed the proceedings in the case and interpreted the decision believe that the same principle is involved in this proposed organization but expect it will have the effect of clearing up misunderstandings which have arisen as to the scope of the Supreme Court decision.

According to information received by representatives of various trade associations, the hosiery and underwear manufacturers' organization proposes to put the "open-price" plan into effect this week, and a statement issued by J. M. McCullaugh, business manager, advises that the members will file price lists in the Philadelphia headquarters where a statistician will direct the compilation of the data and forward it to each member for his own information. It is also proposed to handle production statistics in the same way. This outline of proposed activities is looked upon by some as being similar in several respects to the arrangement carried on by the members of the American Hardwood Manufacturers' Asscciation, which the majority of the Supreme Court condemned. However, Mr. McCullaugh insists that the decision does not affect them in the least, inasmuch as there is nothing in the hosiery and underwear men's dissemination of price or production figures antagonistic to "open-price" competition. Furthermore, he declared that the data will be distributed without comment as to ways and means of increasing or decreasing production or regulating competition.

It is reported that 25 members of the Southeastern Division of the association unanimously endorsed the plan last week. It is the contention of Mr. McCullaugh that manufacturers should be able to follow the trend of the industry from an analysis of the data sent out for that purpose. He is said to have vigorously denounced any intimation that the "open-price" competition system as followed by the association is for any but an honest and fair aim.

## Stack of Trumbull-Cliffs Furnace Co. Lighted

WARREN, OHIO, Jan. 17.—The new 600-ton blast furnace of the Trumbull-Cliffs Furnace Co. was placed in operation Jan. 16, in presence of officials of the Trumbull-Cliffs company and the Trumbull Steel Co. The addition of this stack to the active list brings the total number of furnaces in the Mahoning and Shenango valleys to 17 of 47, the highest number in blast since Feb. 28, 1921. The molten product of the furnace will be carried by a hot metal run across the Mahoning River to the open-hearth department of the Trumbull Steel Co. Surplus output will be diverted to the merchant trade.

Little Miss Mary Reinette Clark, daughter of Mr. and Mrs. E. F. Clark, and granddaughter of Jonathan Warner, president of the Trumbull Steel Co., and Miss Flora Mather, daughter of Mr. and Mrs. S. Livingston Mather of Cleveland, simultaneously applied torches at two different tuyeres, thus lighting the furnace. Mr. Clark is president of the Newton Steel Co., Youngstown, while Mr. Mather is secretary of the Cleveland-Cliffs Iron Co. Grouped about were the officials and employees.

Guests attended the event from Cleveland and Warren, journeying to the furnace in a special coach, and were later entertained at lunch by Mr. Warner at his home in Youngstown, following inspection of the property.

Directors of the Trumbull-Cliffs Furnace Co. are William G. Mather, Jonathan Warner, S. L. Mather, A. N. Flora, D. T. Croxton, Philip Wick, W. H. B. Ward, Allen Hoffer, H. A. Raymond, John T. Harrington and William P. Belden. Officers are: President, W. G. Mather; vice-president, Jonathan Warner; secretary, S. L. Mather, and treasurer, C. G. Heer.

With all modern labor devices, only 100 men will be required to operate the stack.

## Expanding Wheeling Steel Plant

The Wheeling Steel Corporation is actively going ahead with the construction of its new rod and wire mill at Portsmouth, Ohio, and with the extensions and betterments at its Steubenville, Ohio, works. For the latter plant, the company has just closed with the Mackintosh-Hemphill Co., Pittsburgh, for a 35-in. blooming mill, which is to be driven by a four-cylinder Nordberg uniflow reversing engine, this constituting the first attempt in this country to drive a blooming mill with this type of engine. The manipulator for this mill also will be furnished by the Mackintosh-Hemphill Co., which will install one of its newest patented manipulators. The Wheeling Mold & Foundry Co. has been awarded the tables and transfers while the Morgan Construction Co., Worcester, Mass., will furnish one 750-ton and one 900-ton steam hydraulic shears and a 3-cylinder upcut shears. This company some time ago was awarded the contract for a continuous mill for this works. It is probable that the company will close on the cranes for this plant soon. Buildings to house the new rod and wire mill at Portsmouth will be fabricated and erected by the McClintic-Marshall Co., Pittsburgh. The company also is figuring on a new boiler plant at Steubenville, Ohio, to furnish power for the uniflow engines, the boilers to be 250-lb. pressure and to be superheated. It also will install turbo-generators which will make the company independent of outside sources for electric power.

## Bank Takes Over Cromwell Steel Co.

The Guardian Savings & Trust Co., Cleveland, has taken over the plant of the Cromwell Steel Co., Lorain, Ohio, and has placed a custodian in charge. This action was taken to prevent receivership and bankruptcy proceedings and follows a recent adjustment agreement to which committees of bondholders, creditors and stockholders, the Cromwell company and the bank are parties. The obligations of the company include $2,000,000 in bonds on which interest has been defaulted, and approximately $1,000,000 in notes and accounts. About $1,250,000 in bonds, stocks and other claims have been deposited with the bank under the terms of the adjustment agreement. The bank is trying to find a purchaser for the plant.

## COMING MEETINGS

### January

**Engineering Institute of Canada.** Jan. 24 and 25. Annual meeting at Montreal. J. L. Busfield, secretary-treasurer Montreal branch, 260 St. James Street, Montreal.

### February

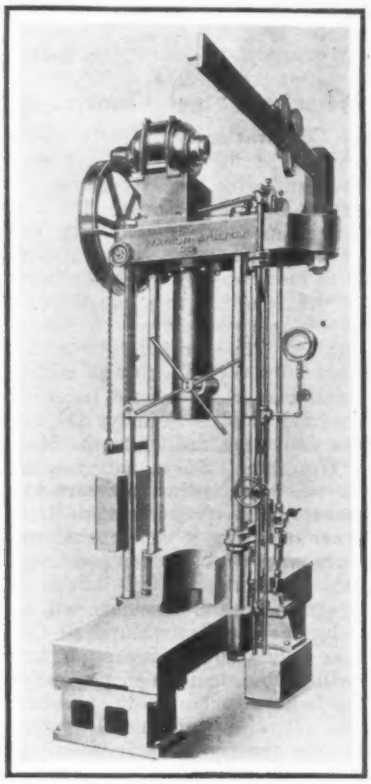
**American Boiler Manufacturers' Association.** Feb. 13. One-day winter meeting. Fort Pitt Hotel, Pittsburgh. Secretary, H. N. Covell, 191 Dikeman Street, Brooklyn, N. Y.

**American Institute of Mining and Metallurgical Engineers.** Feb. 20-25. Spring meeting. Engineering Societies Building, New York. Secretary, Frederick F. Sharpless, 29 West Thirty-ninth Street, New York.

## New Forcing and Bending Press

A press designed for operations involving forcing, pressing and bending, and adaptable more especially to railroad and other large shops, has been placed on the market by the Watson-Stillman Co., New York. It not only provides the means for rapid and convenient pressing in and out of driving box brasses, pressing gears on and off, etc., but because of its wide bed it can be used also for many operations of bending and straightening.

The press is of the reversed cylinder type having the ram movement from the top downward. The pump is required only for the pressure application, the handwheel shown in the illustration being provided for bringing the ram quickly to and from the work. The latter feature thus eliminates waiting for the pump to move the ram through the idle part of the stroke.



The Capacity Is 75 Tons and the Ram Movement 21 In. The bottom platen is 72 in. long

The bottom platen is amply strong for bending with bending blocks on its ends under the full capacity of the press. The "U" piece is hinged to one of the columns of the press which enables it to be swung to the center, as shown, or to one side and out of the way. The jib crane is provided with a trolley which, equipped with a chain hoist, is used in handling the work in and out of the press. The hole in the bottom platen is for receiving shafts and pressing gears and other work.

The drive is either by belt through tight and loose pulleys or by directly attached constant speed motor as shown. The gage indicates the pressure on the ram in pounds per square inch, and the total pressure in tons. The pump is a two-plunger type and the entire control of the press is through a single screw stem valve. The top and bottom platen cylinder and crane bracket are open-hearth steel castings, and the ram and rods of machinery steel. The cylinder is copper-lined.

## Improvement in Shipbuilding Predicted

A combination of developments in the shipbuilding industry that have forged to the front within recent months have given rise to considerable optimism and have served to brighten the outlook for the ensuing year, says Clarence Samuel King, secretary of the Atlantic Coast Shipbuilders' Association, in an article published in the current issue of the Association Bulletin.

"Exclusive of large repair contracts and port development plans recently projected," says Mr. King, "new vessel construction bids for which have not yet been opened but which are definitely contemplated, are reported to aggregate an expenditure of approximately $10,000,000."

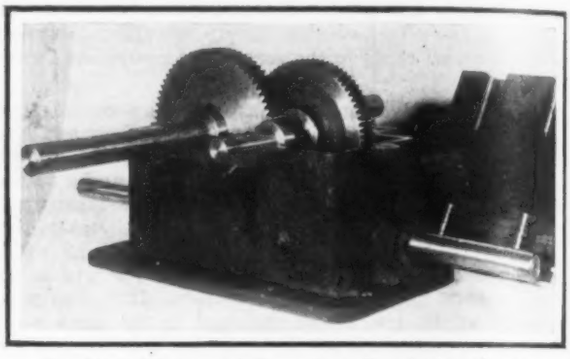
Mr. King states that although 1921 was a lean year for shipbuilders it should not be overlooked that all major industries have suffered proportionately, and while there is little pleasure in suffering even in good company it is gratifying to note that the dearth of shipbuilding contracts has been due to a general recession in world trade and not to faults in the industry.

"Busy times are just around the corner," says Mr. King, and to justify his optimistic forecast reference is made to the idle ships now in our ports which will need much repairing before being placed in service. He also points out that we are greatly in need of fast passenger ships to balance our fleet of cargo carriers.

## Worm and Spur Gear Speed Transformer

A combined worm and spur gear speed transformer of the type shown in the illustration has been placed on the market by the Natisch Gear Works, 451 Hudson Avenue, Brooklyn, N. Y. It is made in various ratios between 1 to 75 and 1 to 1000, and for transmitting up to 5 hp.

The design is similar in all sizes, the same case being used for many different ratios. The change is accomplished by varying the number of teeth in the spur gears and also by changing the pitch and number of teeth in the worm gear. The case is of cast iron, ruggedly built and is oil tight and dust proof. The illustration shows a drive arranged for a ratio of 1 to 600, to transmit ½ hp.

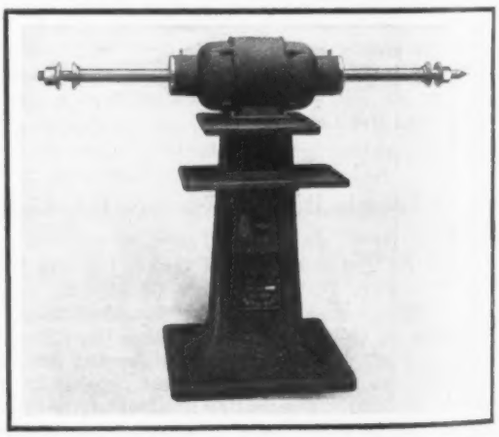


Combined Worm and Spur Gear Speed Transformer

## New Line of Motor-Driven Buffing Machines

A line of alternating current motor buffing machines, built in four sizes from ½ hp. for wheels 6 x ½ in. to 3 hp. for wheels 12 x 2 in., has been placed on the market by the J. G. Blount Co., Everett, Mass.

Among the salient features are S. K. F. ball bearings in dust proof housings, spindles of high carbon steel ground to size, large tool tray bolted to the column, snap switch having thermal cut-outs for motor protection, and a taper point fitted to right-hand end of spindle for small wheels.



Spindles Are of High Carbon Steel Ground to Size

The head or motor unit is regularly mounted with pan on the column, but may be mounted on a bench base if preferred. All parts bolting together are planed or milled to insure proper contact. The safety snap switch is mounted on the column beneath the tool tray, an arrangement intended to protect it from the buffing compounds used, and also from breakage. The motors are of the Westinghouse design. The machines are finished with an oil proof enamel, which permits keeping them looking good by wiping off occasionally.

# Shippers Will Strongly Urge Lower Rates

## Railroad Executives Heard and Will Be Followed by Representatives of Iron and Steel and Other Industries Before the Interstate Commerce Commission

BY L. W. MOFFETT

WASHINGTON, Jan. 17.—Testimony of railroad executives before the Interstate Commerce Commission in its rate investigation will be concluded to-morrow, after which the shippers' side will be presented. On Thursday and Friday of the present week, the rate situation as it applies to coal and coke will be submitted, while on Saturday and Monday representatives of the iron and steel industry will present their case, discussing rates with relation to ore, furnace materials, iron and steel products, etc. Iron and steel manufacturers, as well as producers in all other lines, are demanding lower rates, but naturally are concerned over the labor situation. Railroad executives have repeatedly told the commission that lower costs are necessary before a general reduction can be made. President Daniel Willard of the Baltimore & Ohio Railroad said that rates will eventually come down, but to hasten the movement would be unwise and would not tend to promote the public interest. It has been pointed out that net operating revenues of railroads for November, the latest statistics available, were at the rate of 3.8 per cent handled on the value of railroad properties, while the transportation act provides that the commission shall fix rates which will enable the railroads to earn 6 per cent of their valuation.

"High as railroad charges are, they are not higher relatively than other prices are or were, and it is important to remember that railroad charges or prices were the very last to go up and in the nature of things cannot be the first to come down," Mr. Willard told the commission. "They can and will participate in the downward movement of all other prices."

### Forced Economies

Mr. Willard said that the financial results already obtained by the railroads have been accomplished "only by forced economies that are neither in the public interest nor can they be indefinitely continued."

He pointed out that rate adjustments already have been made to correct disarrangements as to localities and some dislocations as to commodities, and in a few instances adjustments have been made for purely economic reasons, as in the case of certain export rates revised in an effort to stimulate competition in world markets, and more recently with reference to agricultural products which perhaps have more widely and more completely been forced downward to a pre-war basis. Rates having generally been advanced on a uniform or percentage basis, he said, it would seem desirable, in fact, necessary, that when general reductions are made, they should be made in the same way.

President R. H. Aishton, of the American Railway Association, described the organization and work of that association, which, through its various committees and divisions, constantly makes studies of improved methods and practices for the benefit of all the railroads. He showed that the railroads had reduced their fuel consumption per train mile and per ton mile and excluding bad order and surplus freight cars, he showed the average miles per freight car per day had increased in 1921 and the average train speed had increased from 10.3 to 11.6 miles per hour.

### Needs of Railroads

Other railroad representatives testified that on the basis of the present volume of business $791,905,811 would be needed in 1922 by the railroads of the country in order to keep abreast of the present needs of the nation, while $633,043,244, additional would be required in 1922, to be spent in order to handle adequately the volume of traffic under normal conditions.

H. E. Byram, of Chicago, president of the Chicago, Milwaukee & St. Paul railroad, and others, asserted that while some relief has already been provided the carriers through the action of the Railroad Labor Board in reducing wages, it is inadequate to enable any further reduction in wages at this time. Mr. Byram said that while immense opportunities are available for further increasing economy of operation by large investments in reducing grades, double track, improving and increasing terminal facilities, etc., these improvements cannot be made because they would require the investment of large sums of new capital which cannot be obtained unless the earnings of the railroads are such as to satisfy investors that such investments in railroad securities would be safe and productive.

Continuing, Mr. Byram said that it would seem that the need of the immediate situation requires a reduction in operating costs. Fuel and labor, which absorb 80 per cent of the total operating cost, must bear the larger portion of the reduction. Fuel and other supplies already are coming down and the United States Railroad Labor Board decision decreased his company's payroll almost 11 per cent, or about $770,000 per month, effective last July.

### Editor Dunn Testifies

Samuel O. Dunn, of Chicago, editor of the *Railway Age*, testified that because of a progressive decline in railway development in the United States as measured by miles of line and cars and locomotives ordered and built in recent years, the carriers, owing to lack of revenues, have been unable to keep abreast of the growth in other industries. If this continues, he said, the country will be brought face to face with a serious situation where the railroads will be unable to handle the traffic unless by increased earnings they are enabled to obtain increased facilities.

This decline, Mr. Dunn showed, has been accentuated since the war and by 1920 there was an actual reduction in the mileage and in the number of locomotives and freight and passenger cars in service, but the decline in the annual rate of increase had begun long before the war.

In each of the last five years the mileage of railroad line abandoned in the United States has exceeded the mileage of new line built, Mr. Dunn said, and in 1921 the mileage of new lines and the cars and locomotives ordered were less than in almost any previous year in railway history. The new railroad mileage built in 1921 was 475 miles, or less than has been reported in any previous year except in 1920, when only 314 miles were built.

For the five years 1917 to 1921, inclusive, the mileage of railroad abandoned in the United States has totalled 4,989 miles, the witness said. The number of locomotives in service on the railways of the United States increased 7,378 in the four years ended with 1913, Mr. Dunn said, but only 473 in the four years ended with 1917 and 617 in the four years ended with 1920. The number built for service in the United States and Canada in 1921 was 1,185, or less than the number built for the United States alone in any year since 1897.

As to freight cars, the number built in 1921, according to Mr. Dunn, was only 40,292, which is the smallest number ever reported since the *Railway Age* began to compile the statistics in 1899. In 1906 and 1907 alone, Mr. Dunn said, the number built was 516,667. The number of passenger cars built in 1921 for use in the United States was 1,275, the smallest number ever reported except in 1920 and 1919, and the number of new passenger cars ordered during the year was only 246.

# Iron and Steel Markets

## LIGHTER OPERATIONS

### Some Price Concessions on Heavier Products

### Tin Plate Output Well Maintained—Export Orders for Plates, Sheets and Pipe

The common expectation of activity in the early spring is more of an influence in the steel market than anything buyers have done since the year opened. Operation of steel works has fallen off slightly. In the case of the Steel Corporation it has been not far from 40 per cent in the past week, while 30 per cent is not uncommon with independent companies. Pittsburgh reports some buying of lighter products that go into consumption through jobbers.

It is recognized that replenishment demand still must be counted on for alternating improvement in mill schedules, since manufacturing consumers of steel as a rule have no definite plans for increased production in the immediate future. Steel companies are more sanguine of a higher rate of output in the next few months than of a turn for the better in prices.

In new railroad demand the inquiry of the Southern Railway for 26,600 tons of 85-lb. and 8500 tons of 100-lb. rails is the chief new item, and there is an order from the Grand Trunk for 9500 tons of 100-lb. rails for its American lines. Chicago mills are counting on 65,000 tons of steel for the cars placed last week; and 5000 tons more will be needed for 500 cars the Central of Georgia is about to order.

Prices of the principal forms of finished steel are still sagging, though there are producers who have declined business because they would not add $1 or $2 per ton to the losses they have been making lately. While 1.50c. is a common line of resistance on bars and structural shapes, a 1.40c. price on steel plates is not as rare as it was.

The New York-New Jersey tunnel will require 10,000 tons of plates and makers of bolts will be in close competition for the 45,000 kegs that will be needed.

A $1 reduction in bar iron by Eastern makers brings that product to 1.45c., Pittsburgh. In the Middle West, hard steel reinforcing bars have sold down to 1.40c. Some irregularity has developed in wire products and in the past week $2.40 has been done on wire nails, or 10c. per keg below the price last announced.

Sheet mill output in Pittsburgh and outlying districts is on a 75 per cent basis for Steel Corporation and 50 per cent for independent plants. Tin plate mills for some weeks have run at a high rate and are likely to hold to it through the winter. This will be a good year for tin plate.

The Port Arthur (Ont.) Shipbuilding Co. has placed 4000 tons of plates for a lake boat for Canadian account. Lake shipyards are figuring on one or two ore vessels.

December business in fabricated steel work amounted to 71,500 tons against about 99,000 tons in each of the two previous months. Of the 758,000 tons contracted for in 1921, 47 per cent developed in the last four months.

Many foundries are planning to bid on the segments for the New York-New Jersey vehicular tunnel, which will require over 100,000 tons of pig iron, but the largest tonnage inquired for by any foundry is 50,000, to be delivered over a period of 20 months at the rate of 2500 tons per month. Owing to the long period of delivery, furnaces are very slow to sell and their policy has not yet been definitely determined. Southern pig iron has again receded 50c. to $16. In the North there is very little activity, but prices are fairly well maintained. A western Pennsylvania steel company has appeared in the market as a seller of foundry iron.

An interesting item in the export trade is the sale of 5000 tons of plates for a Melbourne, Australia, water pipe line. England was a close competitor. Japan has bought here 2000 tons of large pipe for a high pressure line, and at Chicago an independent mill has a 3000-ton sheet order from Japan.

Brazil, India, China and Japan figure in current tin plate buying. From South Africa as well as South America considerable inquiry is now before export steel companies.

Drastic price cuts in England, in both pig iron and steel items, have resulted in virtually stopping Continental competition. Sheets and tin plates are weaker, production exceeding demand.

THE IRON AGE composite price for pig iron is at last back again at the low point of $18.52 which it touched in August last.

## Pittsburgh

PITTSBURGH, Jan. 17.

Completion of inventories is beginning to find reflection in a slightly better demand for a number of steel products, notably in the lighter materials which usually pass into consumptive channels through jobbing and warehouse interests. Another important development of the past week has been increased steadiness in prices. The effort to stimulate business by cutting prices and also by attempting advances over what had previously been done, as in the case of sheets, having failed, the trade now is inclined to make something of a stand on the basis of quotations of the last few weeks. The heavy tonnage products are more confidently quoted at 1.50c. base, Pittsburgh, than was the case recently, and on bars and structural shapes the claim is made that some business has been entered as high as 1.60c. There continues to be some doubt as to the real basis of plates, makers asserting that 1.50c. is minimum, while buyers are equally firm in their insistence that 1.40c. can be done on real orders. Buyers of the heavier lines are placing the business at the lowest delivered price and this condition localizes strictly the business of the mills in the different centers. Irregularity still marks both the demand and prices for wire products, but efforts to depress the sheet prices established late last November have been unsuccessful and it is noted that blue annealed sheets in the heavier gages now are fully up in price to the lighter gages. Demand in general characteristics is much as it has been during the past

# A Comparison of Prices

**Advances Over the Previous Week in Heavy Type, Declines in Italics**
**At date, one week, one month, and one year previous**

**For Early Delivery**

| Pig Iron, Per Gross Ton: | Jan. 17, 1922 | Jan. 10, 1922 | Dec. 20, 1921 | Jan. 18, 1921 |
|---|---|---|---|---|
| No. 2X, Philadelphia‡ | $21.34 | $21.34 | $21.34 | $33.25 |
| No. 2, Valley furnace† | 19.50 | 19.50 | 19.50 | 31.50 |
| No. 2, Southern, Cin'ti† | *20.50* | 21.00 | 21.50 | 36.50 |
| No. 2, Birmingham, Ala† | *16.00* | 16.50 | 17.50 | 32.00 |
| No. 2 foundry, Chicago* | 19.00 | 19.00 | 19.50 | 31.00 |
| Basic, del'd, eastern Pa. | 20.25 | 20.25 | 20.25 | 33.86 |
| Basic, Valley furnace | 18.25 | 18.25 | 18.25 | 30.00 |
| Bessemer, Pittsburgh | 21.46 | 21.46 | 21.96 | 33.96 |
| Malleable, Chicago* | 19.00 | 19.00 | 19.50 | 31.50 |
| Malleable, Valley | 19.50 | 19.50 | 20.00 | 32.00 |
| Gray forge, Pittsburgh | 20.96 | 20.96 | 20.96 | 32.46 |
| L. S. charcoal, Chicago | 31.50 | 31.50 | 31.50 | 40.50 |
| Ferromanganese, del'd | 60.00 | 60.00 | 60.00 | 100.00 |
| **Rails, Billets, etc.,** Per Gross Ton: | | | | |
| O.-h. rails, heavy, at mill | $40.00 | $40.00 | $40.00 | $47.00 |
| Bess. billets, Pittsburgh | 28.00 | 28.00 | 29.00 | 43.50 |
| O.-h. billets, Pittsburgh | 28.00 | 28.00 | 29.00 | 43.50 |
| O.-h. sheet bars, P'gh | 29.00 | 29.00 | 30.00 | 47.00 |
| Forging billets, base, P'gh. | 32.00 | 32.00 | 32.00 | 48.50 |
| O.-h. billets, Phila. | 33.74 | 33.74 | 33.74 | 49.24 |
| Wire rods, Pittsburgh | 36.00 | 36.00 | 38.00 | 57.00 |
| | Cents | Cents | Cents | Cents |
| Skelp, gr. steel, P'gh, lb. | 1.50 | 1.50 | 1.50 | 2.45 |
| Light rails at mill | 1.50 | 1.50 | 1.55 | 3.00 |
| **Finished Iron and Steel,** | | | | |
| *Per Lb. to Large Buyers:* | Cents | Cents | Cents | Cents |
| Iron bars, Philadelphia | *1.81* | 1.85 | 1.85 | 2.70 |
| Iron bars, Chicago | 1.60 | 1.60 | 1.60 | 2.68 |
| Steel bars, Pittsburgh | 1.50 | 1.50 | 1.50 | 2.35 |
| Steel bars, Chicago | 1.60 | 1.60 | 1.60 | 2.73 |
| Steel bars, New York | 1.88 | 1.88 | 1.88 | 2.73 |
| Tank plates, Pittsburgh | 1.50 | 1.50 | 1.50 | 2.65 |
| Tank plates, Chicago | 1.60 | 1.60 | 1.60 | 3.03 |
| Tank plates, New York | 1.83 | 1.83 | 1.83 | 3.03 |
| Beams, Pittsburgh | 1.50 | 1.50 | 1.50 | 2.45 |
| Beams, Chicago | 1.60 | 1.60 | 1.60 | 2.83 |
| Beams, New York | 1.88 | 1.88 | 1.88 | 2.83 |
| Steel hoops, Pittsburgh | 2.00 | 2.00 | 2.00 | 3.05 |

*The average switching charge for delivery to foundries in the Chicago district is 70c. per ton.
†Silicon, 1.75 to 2.25. ‡Silicon, 2.25 to 2.75.

| **Sheets, Nails and Wire,** *Per Lb. to Large Buyers:* | Jan. 17, 1922 Cents | Jan. 10, 1922 Cents | Dec. 20, 1921 Cents | Jan. 18, 1921 Cents |
|---|---|---|---|---|
| Sheets, black, No. 28, P'gh | 3.00 | 3.00 | 3.00 | 4.35 |
| Sheets, galv., No. 28, P'gh | 4.00 | 4.00 | 4.00 | 5.70 |
| Sheets, blue an'l'd, 9 & 10 | 2.25 | 2.25 | 2.25 | 3.55 |
| Wire nails, Pittsburgh | 2.50 | 2.50 | 2.75 | 3.25 |
| Plain wire, Pittsburgh | 2.25 | 2.25 | 2.50 | 3.25 |
| Barbed wire, galv., P'gh | 3.15 | 3.15 | 3.40 | 4.10 |
| Tin plate, 100-lb. box, P'gh | $4.75 | $4.75 | $4.75 | $7.00 |
| **Old Material,** Per Gross Ton: | | | | |
| Carwheels, Chicago | $15.50 | $15.50 | $15.50 | $21.00 |
| Carwheels, Philadelphia | 16.50 | 16.50 | 16.50 | 25.00 |
| Heavy steel scrap, P'gh | 14.50 | 14.50 | 14.50 | 16.00 |
| Heavy steel scrap, Phila. | 11.50 | 11.50 | 11.50 | 14.50 |
| Heavy steel scrap, Ch'go | 11.50 | 11.50 | 11.00 | 15.00 |
| No. 1 cast, Pittsburgh | 16.50 | 16.25 | 16.00 | 25.00 |
| No. 1 cast, Philadelphia | 16.50 | 16.50 | 16.50 | 24.50 |
| No. 1 cast, Ch'go (net ton) | 13.00 | 13.00 | 12.50 | 17.00 |
| No. 1 RR. wrot, Phila. | 14.50 | 14.50 | 14.50 | 20.00 |
| No. 1 RR. wrot, Ch'go (net) | 10.50 | 10.50 | 10.50 | 13.50 |
| **Coke, Connellsville,** Per Net Ton at Oven: | | | | |
| Furnace coke, prompt | $2.75 | $2.75 | $2.75 | $5.00 |
| Foundry coke, prompt | 3.75 | 3.75 | 3.75 | 6.50 |
| **Metals,** | | | | |
| *Per Lb. to Large Buyers:* | Cents | Cents | Cents | Cents |
| Lake copper, New York | 13.87½ | 13.87½ | 13.87½ | 13.25 |
| Electrolytic copper, refinery | 13.62½ | 13.62½ | 13.62½ | 13.00 |
| Zinc, St. Louis | 4.77½ | 4.77½ | 4.90 | 5.55 |
| Zinc, New York | 5.12½ | 5.12½ | 5.25 | 6.00 |
| Lead, St. Louis | 4.40 | 4.40 | 4.40 | 4.90 |
| Lead, New York | 4.70 | 4.70 | 4.70 | 5.12½ |
| Tin (Straits), New York | *32.00* | 32.12½ | 33.00 | 34.75 |
| Antimony (Asiatic), N. Y. | *4.45* | 4.50 | 4.50 | 5.15 |

The prices in the above table are for domestic delivery and do not necessarily apply to export business.

**Composite Price, Jan. 17, 1922, Finished Steel, 2.062c. Per Lb.**

Based on prices of steel bars, beams, tank plates, plain wire, open-hearth rails, black pipe and black sheets

These products constitute 88 per cent of the United States output of finished steel.

| | |
|---|---|
| Jan. 10, 1922, | 2.062c. |
| Dec. 20, 1921, | 2.098c. |
| Jan. 18, 1921, | 3.057c. |
| 10-year pre-war average, | 1.684c. |

**Composite Price, Jan. 17, 1922, Pig Iron, $18.52 Per Gross Ton**

Based on average of basic and foundry irons, the basic being Valley quotation, the foundry an average of Chicago, Philadelphia and Birmingham

| | |
|---|---|
| Jan. 10, 1922, | $18.60 |
| Dec. 20, 1921, | 18.85 |
| Jan. 18, 1921, | 31.04 |
| 10-year pre-war average, | 15.72 |

few weeks. Buyers are covering only their most pressing needs and insisting on prompt delivery. The gain in business has been in the number of orders rather than in the size, and the mills still have difficulty in building up back logs.

Plant operations in this district do not change much as far as the steel works are concerned but finishing mill operations show some expansion, notably in sheets. The independents are now averaging close to 50 per cent and the Steel Corporation sheet subsidiaries about 75 per cent. Strip mill activities also are somewhat heavier than they were recently. Tin plate mills, which for several weeks have been running at a high rate, show no signs of an immediate let down.

Entrance of the Cambria Steel Co. into the market as a maker of foundry iron is a feature of an otherwise uninteresting situation in pig iron. This company is reported to have taken some business in and around Johnstown on a basis of $19.50 furnace for No. 2. This means a further restriction in the territory of furnaces which previously had served Johnstown melters of foundry grade. The scrap market remains firm in the face of only a moderate demand from the steel makers. The situation in coke and coal is without new features.

Pig Iron.—This market again has become extremely dull, the only important sale of the past week being 500 tons of basic to a Pittsburgh district sheet maker at about $18.25, at Valley furnace. Information about this sale is limited, but the common impression is that the iron was sold by a furnace with a lower freight rate to point of consumption than Valley furnaces. Follansbee Bros. Co. again is seeking 1000 tons of basic for prompt delivery. Nothing lately has been done in Bessemer or malleable iron and interest in foundry grade centers about an inquiry for 3000 tons by the Oil Well Supply Co. of iron of 1.60 to 2 per cent in silicon, 0.05 and under in sulphur and 0.40 to 0.70 in phosphorus and manganese. Some makers have quoted $19.50 Valley furnace against this inquiry, and others $19, but the company claims to have had a quotation of $18.50. The tonnage, which is for delivery during the remainder of this quarter, is expected to be placed in a day or two.

We quote Valley furnace, the freight rate for delivery to the Cleveland or Pittsburgh district being $1.96 per gross ton:

| | |
|---|---|
| Basic | $18.25 |
| Bessemer | 19.50 |
| Gray forge | 19.00 |
| No. 2 foundry | 19.50 |
| No. 3 foundry | 19.00 |
| Malleable | 19.50 |

**Ferroalloys.**—Inquiries are somewhat more numerous than they were recently, but as yet there has been no corresponding gain in actual sales. Apparently the enlarged interest of consumers is created by fears

about the new tariff rather than by actual needs, as most of them are running at a low rate and have fair-sized stocks on hand or under contract. Prices do not change much. The latest business in 50 per cent ferrosilicon was 100 tons to a Pittsburgh foundry interest on the basis of $55 delivered. This price about measures the market, despite the efforts on the part of producers to obtain $60 or more. The market on spiegeleisen shows a firmer tendency, the result of the fact that production for several months past has been practically nil, and there has been a sufficient demand to materially reduce makers stocks. Practically no 20 per cent material now is available and that of lower manganese content is not plenty. The former grade is nominally quotable at $26, furnace, or $30 to $32 delivered this immediate territory, and 16 to 19 per cent at $25, furnace. Hardly enough has been done recently in ferromanganese to establish any change in prices.

We quote 78 to 82 per cent domestic ferromanganese at $59 to $63.67 delivered; 78 to 82 per cent foreign ferromanganese, $58.35, c.i.f. Atlantic seaboard; German, for 76 to 80 per cent, $54, seaboard. Average 20 per cent spiegeleisen at $30 to $32 delivered, Pittsburgh or Valleys; 16 to 19 per cent spiegeleisen, $28 to $30 delivered Pittsburgh; 50 per cent ferrosilicon, domestic, $54 to $57, freight allowed. Bessemer ferrosilicon is quoted f.o.b. Jackson and New Straitsville, Ohio, furnaces as follows: 10 per cent, $38.50; 11 per cent, $41.80; 12 per cent, $45.10; 13 per cent, $49.10; 14 per cent, $54.10; silvery iron, 6 per cent, $27; 7 per cent, $28; 8 per cent, $29.50; 9 per cent, $31.50; 10 per cent, $33.50; 11 per cent, $36; 12 per cent, $38.50. The present freight rate from Jackson and New Straitsville, Ohio, into the Pittsburgh district is $4.06 per gross ton.

**Billets, Sheet Bars and Slabs.**—So little is going on as to make impossible anything more than an appraisal of prices. A number of makers of sheet bars, who during the latter part of December entered contracts for January and first quarter delivery report specifications from sheet makers to be extremely difficult to obtain. Makers of tin plate, however, are specifying fairly freely. Interest in billets and slabs still is extremely small. There has been some increase in open-hearth and Bessemer furnace operations in the Valley district, but here in Wheeling no appreciable change is noted.

We quote 4 x 4 in. soft Bessemer and open-hearth billets at $28 to $29; 2 x 2 in. billets, $29 to $30; Bessemer and open-hearth sheet bars, $30; slabs, $29 to $30; forging billets, ordinary carbons, $32 to $33, all f.o.b. Youngstown or Pittsburgh mills.

**Wire Rods.**—Export demands to a considerable extent counterbalance a lack of demand of the usual proportions from domestic consumers, and makers in this district are doing a relatively good business. The base price ranges from $36 to $38, Pittsburgh or Youngstown, depending upon the origin and size of the order. Prices are given on page 247.

**Steel Skelp.**—Interest in this material is not especially large and the quotation of 1.50c. Pittsburgh, for steel pipe skelp is nominal and untested.

**Steel Rails.**—The railroads still are moving cautiously in the matter of specifications on standard rail orders, and this is reflected in rather light operations of the rail mills. It is evidently not the intention of makers to build up stocks in anticipation of future releases, as such a course proved pretty costly last year. Interest in light rails is limited and prices are easy. These sections rolled from new steel now are offered at 1.55c. by leading makers and actually have been sold at 1.50c.

We quote 25 to 45-lb. sections, rolled from new steel, 1.55c. base; rolled from old rails, 1.45c. to 1.50c. base; standard rails, $40 per gross ton mill for Bessemer and open-hearth sections.

**Iron and Steel Bars.**—The most interesting development of the past week in steel bars is a firmer stand by makers on a base of 1.50c. and an effort which has been successful in part to obtain $1 or $2 per ton more for small lots. Sizable lots can be placed at 1.50c., but bids of less are not getting much consideration. Makers of refined iron bars still are quoting them at 2.15c., base, but with common iron bars available at 1.85c. delivered from Eastern mills, it is rather difficult for local makers to obtain quotations.

We quote steel bars rolled from billets at 1.50c. to 1.60c.; reinforcing bars, rolled from billets, 1.50c. to 1.60c. base; reinforcing bars, rolled from old rails, 1.35c. to 1.40c.; refined iron bars, 2c. to 2.10c. in carloads, f.o.b. mill, Pittsburgh.

**Wire Products.**—One important maker here reports the past week to have been the best in the matter of orders and specifications since early last fall, the betterment being ascribed by this interest to its firm refusal to consider less than $2.50 base per keg for bright nails, $2.25 base per 100-lb. for plain wire and $2 base per count keg for cement coated nails. Other makers have experienced no appreciable gain in business due to the fact, they say, that there is so much talk of concessions that their customers are inclined to move slowly in the matter of purchases. There has been no public announcement of any reduction from the Dec. 21 prices, but there are well authenticated instances of manufacturers asking buyers to come back if they are quoted less than the recognized market quotation.

We quote wire nails at $2.50 base per keg, Pittsburgh, and bright basic and Bessemer wire at $2.25 base per 100 lb., Pittsburgh.

**Sheets.**—The leading interest reports the past week to have been the best both as far as shipments and mill operations that it has had in the past few months. It enjoyed an average operation for the week of slightly more than 75 per cent of capacity. Independents also have had some increase in business, current orders being at the rate of about 50 per cent of normal production. The feature of the market is the continued firm adherence on the part of all makers to 3c. base, Pittsburgh, for black sheets, and 4c. base Pittsburgh for galvanized. An interesting development is that the market lately has been growing stronger on blue annealed sheets which have sold at 2.25c. base for the heavy, as well as the light, gages. There are reports from the East, notably from Philadelphia, that concessions of as much as $5 per ton have been made on galvanied sheets, but verification is lacking and the reduced prices are believed to refer to some liquidating sales by jobbing interests. Prices are given on page 247.

**Tin Plate.**—The market continues satisfactory in that container manufacturers are specifying against contracts freely and there is a continued high rate of operation of mills in this and nearby districts. The leading interest last week operated close to 90 per cent of capacity and independent operations ran almost as high despite the fact that a few of them still were idle. Less disposition to make prices attractive is noted and only the large consumers, who usually have preferential price treatment, now are able to buy production plate much under $4.75 per base box.

We quote standard production coke tin plate at $4.75 per base box f.o.b. Pittsburgh for carload lots.

**Cold-Finished Steel Bars and Shafting.**—Some makers of cold-rolled and cold-drawn screw stock and shafting detect a slightly better inquiry and also a somewhat firmer tendency of prices, which is manifest in the reappearance in a number of centers of the usual price differential for less than carload tonnages. For the larger lots there are fewer instances than recently of a willingness on the part of makers to accept less than 2c. base Pittsburgh. The Cumberland Steel Co. effective Jan. 13, made a reduction of $5 per ton in ground shafting to $2.25 per 100-lb. base for carloads and $2.50 per 100-lb. base for less than carloads, with the usual extras, f.o.b. cars, Cumberland, Md.

**Hoops and Bands.**—Cooperage material still is firmly held at 2c. base, Pittsburgh, but on the heavier gages the market is quotable from 1.75c to 2c. In the latter, competition for business is sharp because there are so many manufacturers who have facilities for rolling what is classified as band steel. Some of them are using the old bar card in making prices.

**Hot-rolled and Cold-rolled Strips.**—Now that jobbers and consumers have practically completed their inventories and know where they stand, manufacturers of strips are beginning to get more orders and also specifications against old business. Demand, however, is good only by comparison with the extremely limited buying of the past two weeks. There is no special change in prices, cold-rolled strips holding fairly well

at 2.50c. base Pittsburgh, while hot-rolled strips are 2c. base Pittsburgh, for carload lots, with some concessions being made to quantity buyers.

**Nuts and Bolts.**—Makers in this district still report no occasion for satisfaction over the amount of business coming in. Both consumers and jobbers are going along with rather light stocks, but despite that fact they are inclined to make frequent small purchases rather than enter their requirements for a period of a month or longer. Discounts are given on page 247.

**Rivets.**—There has been no appreciable improvement in business, but it is expected that with the completion of inventories, consumers and distributors will find themselves in need of supplies at least to round out their stocks, and the next few weeks are expected to see some increase in orders. No change is noted in prices or discounts, which are to be found on page 247.

The market still leans in buyer's favor. On large lots of standard spikes as low as $2.15 base per 100-lb. lately has been done. That was the base on 11,700 kegs for the Louisville & Nashville railroad, taken by a Pittsburgh maker. The Missouri Pacific Railroad has closed for 1000 kegs with a Western maker. The Southern Pacific Co. inquiry for 2000 kegs still is open. The maximum on carload lots of standard spikes now is $2.20 base and small spikes also are down about $1 from recent quotations. New prices are given on page 247.

**Structural Material.**—Makers are inclined to take a firmer stand on prices, although both sales and inquiries are few and small. Fabricating shops in this district are figuring upon a fair number of inquiries, but most of the projects are outside this immediate district. Mills here are holding pretty firmly to 1.50c. as a minimum, and are encouraged in this attitude by the news that a large Eastern mill recently quoted 1.50c. to 1.60c. against a structural steel inquiry of the New York Central Lines. Prices are given on page 247.

**Plates.**—The market is such a limited affair as regards demand and sales that prices are not at all well defined. Makers insist that 1.50c. is minimum, but buyers claim that if they had orders to place they would not have to go above 1.40c. or 1.45c. Not much business recently has been taken by tank or barge builders and the car shops are getting close to the end of their railroad repair orders.

We quote sheared plates, ¼ in. and heavier, tank quality, at 1.50c. f.o.b. Pittsburgh.

**Iron and Steel Pipe.**—Makers of both steel and wrought iron pipe are having a fair run of orders in merchant pipe, but note no abandonment on the part of buyers of a policy of meeting only their actual requirements. Not much is going on in oil well or line pipe, due to fears of lower oil prices in other fields following the recent reductions in Pennsylvania crude oil. Booth & Flinn, Ltd., have put out an inquiry for 400 tons of 5, 4, 6, 8 and 12-in. pipe for the new vehicular tunnel in New York. Prices are holding fairly well in all lines, although there are intimations that a sizable order for line pipe might occasion some sharpening of pencils. Discounts are given on page 247.

**Boiler Tubes.**—Demand in both steel and iron tubes is purely hand to mouth, and while orders are coming along steadily, few of them are for sizable lots. Prices are rather easy, especially on seamless steel tubes, which are selling at prices well under cost. The railroads are making occasional purchases of the latter. Discounts are given on page 247.

**Coke and Coal.**—There is only a limited market for spot tonnages of furnace coke and efforts to bring prices more in line with these for contracts have not yet been especially successful. Operators with tonnages available for immediate delivery generally are asking $3 per net ton, oven, but consumers still claim ability to secure supplies anywhere from 10c. to 25c. below that price. Spot foundry coke holds at $3.75 to $4.25. The coal market remains dull and weak on spot tonnages. Non-union mine run steam coal recently sold as low as $1.35 and $1.50 has become the maximum figure. Non-union by-product coal, mine run grade, is selling anywhere from $1.50 to $1.75. Gas coal, coming entirely out of union districts, is quotable from $2 to $2.35 for run of mine.

**Old Material.**—The market exhibits a very firm tone, notwithstanding that the demand from the steel companies still is light. This outwardly finds its chief explanation in the fact that dealers still have some short contracts to cover and are easily frightened into paying rather stiff prices by the fact that open market offerings are moderate. The steel foundries lately have been taking on tonnages with some freedom and their purchases have contributed to the firmness of the market on the better grades of railroad steel. There is sufficient demand to keep the market clear of the lighter grades of open hearth material, prices of which are well maintained.

We quote for delivery to consumers' mills in the Pittsburgh and other districts taking the Pittsburgh freight rate, as follows:

| | |
|---|---|
| Heavy melting steel, Steubenville, Follansbee, Brackenridge, Monessen, Midland and Pittsburgh | $14.50 to $15.00 |
| No. 1 cast, cupola size | 16.50 to 17.00 |
| Rerolling rails, Newark and Cambridge, Ohio; Cumberland, Md.; Huntington, W. Va., and Franklin, Pa. | 15.50 to 16.00 |
| Compressed sheet steel | 11.75 to 12.00 |
| Bundled sheets, sides and ends | 10.50 to 11.00 |
| Railroad knuckles and couplers | 15.50 to 16.00 |
| Railroad coil and leaf springs | 15.50 to 16.00 |
| Low phosphorus standard bloom and billet ends | 17.50 to 18.00 |
| Low phosphorus plates and other grades | 17.00 to 17.50 |
| Railroad malleable | 12.50 to 13.00 |
| Iron car axles | 23.00 to 24.00 |
| Locomotive axles, steel | 21.00 to 22.00 |
| Steel car axles | 15.50 to 16.00 |
| Cast iron wheels | 15.00 to 15.50 |
| Rolled steel wheels | 15.50 to 16.00 |
| Machine shop turnings | 9.50 to 10.00 |
| Sheet bar crop ends | 14.50 to 15.00 |
| Heavy steel axle turnings | 11.50 to 12.00 |
| Short shoveling turnings | 10.75 to 11.00 |
| Heavy breakable cast | 14.25 to 14.75 |
| Stove plate | 13.00 to 13.50 |
| Cast iron borings | 10.75 to 11.00 |
| No. 1 railroad wrought | 11.50 to 12.00 |

## Poor Year's Business in Fabricated Steel

The records of the Bridge Builders and Structural Society, from reports collected by its secretary, George E. Gifford, 50 Church Street, New York, show that in December 71,500 tons of fabricated steel was contracted for throughout the United States. This is roughly equivalent to 40 per cent of the capacity of the bridge and structural shops of the country, put at 180,000 tons per month.

The total fabricated steel business for 1921 appears thus to be 758,000 tons or 35 per cent of annual capacity. This exceedingly low performance of slightly over 63,000 tons per month compares with about 90,000 tons per month in the two poor years of 1913 and 1914 and with nearly 105,000 tons per month for the nine years of 1912 to 1920 inclusive. Whereas normally the tenth year of the decade should, other things being equal, show a large total, as a mark of the expansion of the country, the 1921 volume is in fact only 70 per cent of either of the two poorest years for which records are available. The foregoing recapitulation is merely another commentary on a year which furnishes many records for low production.

## Buffalo Iron and Steel Makers Complain

WASHINGTON, Jan. 17.—Formal complaint for filing with the Interstate Commerce Commission has been prepared by counsel representing iron and steel makers in the Buffalo district charging that they are unduly discriminated against in rates on iron ore, coal and coke which they have to pay in favor of interior competitors by reason of rates the latter pay on ore. The complaint puts in formal shape charges which have been informally made previously, resulting in a hearing before members of the commission and the ordering by the commission of the restoration of the old rates on ore, effective Jan. 11 from Lake Erie ports to interior furnaces.

# Chicago

CHICAGO, Jan. 17.

The market is exceptionally quiet in all departments. A slight improvement in the wire trade is noted, and a fair amount of soft steel bar business is coming from miscellaneous sources, while sheets, though firm, are inactive so far as the domestic market is concerned. Further tonnage is being booked from abroad, however, the local independents having taken orders for 3000 tons of sheets from Japan within the past week. It will take some time for the specifications to be prepared for the steel required for the cars recently placed by the railroads, but local mills expect to book 65,000 tons for that work. Other car orders are looked for soon, the largest among them being 7300 cars which will be bought by the Burlington.

In the building construction field the largest inquiry which has come out for many weeks is one calling for 15,000 to 20,000 tons for the head-house and concourse of the Chicago Union Station. This project, which has undergone numerous delays since its inception, is now scheduled to reach completion within two years.

Although the local building trades council failed to call a strike a week ago, an insurgent movement has sprung up in the union ranks which threatens to tie up all construction jobs on which non-union labor is employed. Of broader significance is the threatened strike of bituminous coal miners, scheduled for April 1. With labor troubles in the coal, building and railroad industries still demanding settlement, progress toward industrial recovery is impeded, and buyers of iron and steel continue to adhere to a cautious policy in covering their needs.

Mill and furnace operations are on about the same basis as a week ago. The Illinois Steel Co. has made a slight gain in steel output, being on a 33 per cent basis, but the Inland Steel Co. and other producers are running at approximately the same rate as last reported.

**Pig Iron.**—New inquiries are small, ranging from carloads to 300, 400 and 500 tons. Interest is centered in 2000 tons of malleable wanted by the Auto Specialties Co., Benton Harbor, Mich., for second quarter delivery. This is the only large inquiry still pending and it is possible that it will bring out concessions below present ruling prices. On ordinary business, however, the ruling market is $19, base, local furnace, for foundry, malleable and basic. Few orders of any size have been closed within the past week. Weakness in Southern iron is reported and some observers believe that this product will soon become a factor in some parts of this territory where the freight advantage is not too much in favor of Chicago. Recent sales of Southern foundry include 400 tons for local delivery and 200 tons for Michigan delivery, both of which were closed at $16, base, Birmingham. In support of the belief that even lower prices might be quoted, attention is called to a Southern interest which is said to be quoting f.o.b. furnace rather than f.o.b. Birmingham, thereby reducing the freight charge which is included in the delivered price. There is little activity in charcoal, low phosphorus and silvery irons. In connection with silvery, it is to be noted that competition by electric furnaces is confined largely to grades from 9 per cent up, and does not so seriously affect 7 and 8 per cent business.

Quotations on Northern foundry, high phosphorus malleable and basic irons are f.o.b. local furnace and do not include a switching charge averaging 70c. per ton. Other prices are for iron delivered at consumers' yards, or when so indicated, f.o.b. furnace other than local.

| | |
|---|---|
| Lake Superior charcoal, averaging sil. 1.50, delivered at Chicago | $31.50 |
| Northern coke, No. 1, sil. 2.25 to 2.75 | 19.50 |
| Northern coke, foundry, No. 2, sil. 1.75 to 2.25 | 19.00 |
| Northern high phos | 19.00 |
| Southern foundry, sil. 1.75 to 2.25 | 22.67 |
| Malleable, not over 2.25 sil | 19.00 |
| Basic | 19.00 |
| Low phos., Valley furnace, sil. 1 to 2 per cent copper free | 33.00 |
| Silvery, sil. 8 per cent | $32.82 to 34.82 |

**Ferroalloys.**—Outside of local inquiries for two cars of spiegeleisen and one carload of ferromanganese, the market is quiet. Some weakness has developed in 50 per cent ferrosilicon and it is now available at from $56.50 to $57.50, delivered.

We quote 78 to 82 per cent ferromanganese, $66.75, delivered; 50 per cent ferrosilicon, $56.50 to $57.50, delivered; spiegeleisen, 18 to 22 per cent, $36 to $37, delivered.

**Railroad Equipment.**—The Burlington has ordered 74 all-steel passenger carrying cars from the Pullman Co. and 56 all-steel baggage and mail cars from the Standard Steel Car Co. The Central of Georgia is expected to place 500 box cars this week and the Union Pacific will take early action on 38 passenger service cars.

**Rails and Track Supplies.**—Buying of standard steel rails is suspended for the present and no inquiries are now active before mills. The rail mill at Gary will be idle practically all this month. Tonnages held over from last year will supply most roads with sufficient rails for ready work and there is no pressure for buying at this time. Track fastenings are equally slack in this market.

Standard Bessemer and open-hearth rails, $40; light rails rolled from new steel, 1.60c. to 1.65c. f.o.b. makers' mills.

Standard railroad spikes, 2.15c. to 2.25c., Pittsburgh; track bolts with square nuts, 3.20c. to 3.25c., Pittsburgh; fish plates, steel and iron, 1.875c. to 2c., f.o.b. mill; angle bars, 2.40c., f.o.b. mill.

**Bars.**—Bar buying is confined to small lots from a wide variety of sources, making a fair total. Buyers lack confidence in the future and buy from hand to mouth, knowing mills can make immediate delivery. However, this condition may change almost without warning, leaving the slow buyer without stock. One mill in Chicago is now scheduled full for six weeks. An inquiry for 1000 tons for reinforcing where soft steel or rerolled bars may be used is encouraging to makers of the latter. Paul J. Kalman Co. will furnish 205 tons for highway work in Marion and Fayette counties, Ill. Bar iron demand is somewhat better and mills are operating heavier, most demand being from railroads. No bar iron has been specified for newly bought cars, and soft steel, cheaper than iron, is believed to be substituted. Rerolled bars are not active.

Mill prices are: Mild steel bars, 1.60c. to 1.70c., Chicago; common bar iron, 1.60c., Chicago; rail carbon, 1.50c., mill or Chicago.

Jobbers quote 2.53c. for steel bars out of warehouse. The warehouse quotation on cold-rolled steel bars and shafting is 3.40c. for rounds and 3.90c. for flats, squares and hexagons. Jobbers quote hard and medium deformed steel bars at 2.35c. base. Hoops and bands, 3.13c.

**Wire Products.**—Good buying of wire and nails, especially the latter, has marked the past week, coming from practically all sources except from manufacturers. Nails are especially in demand. Mills now have good stocks in warehouses and can make immediate shipments. Jobbers are still engaged in inventory, but this has not delayed buying. Prices are steady and unchanged.

We quote warehouse prices f.o.b. Chicago: No. 9 and heavier black annealed wire, $3.13 per 100 lb.; No. 9 and heavier bright basic wire, $3.28 per 100 lb.; common wire nails, $3.25 per 100 lb.; cement coated nails, $2.65 per keg.

The mill quotation on plain material ranges from 1.60c. to 1.75c., Chicago. Jobbers quote 2.78c. for materials out of warehouse.

**Sheets.**—Domestic consumers of sheets are not buying much and producers would be in a bad way except for export tonnage, which makes 50 per cent of their tonnage in some cases. The local independent continues operation at full capacity. Prices are held firmly in spite of small buying.

Mill quotations are 3c. for No. 28 black, 2.25c. for No. 10 blue annealed and 4c. for No. 28 galvanized, all being Pittsburgh prices, subject to a freight rate to Chicago of 35c. per 100 lb.

Jobbers quote: Chicago delivery out of stocks, No. 10 blue annealed, 3.38c.; No. 28 black, 4.15c.; No. 28 galvanized, 5.15c.

**Plates.**—Slow specification of material by car builders is rendering the plate market slack, especially as oil tank demand has fallen to nothing and other plate users do not require much material. Renewal of auto-

mobile production promises increased demand from that source. Prices remain unchanged.

The ruling mill quotations range from 1.60c. to 1.70c., Chicago. Jobbers quote 2.63c. for plates out of stock.

**Bolts and Nuts.**—No revival is seen in this market and producers are operating at a slack rate, buying being in small lots. Discounts are being disregarded and every maker has his own price.

Jobbers quote structural rivets, 3.43c.; boiler rivets, 3.53c.; machine bolts up to ¾ x 4 in., 60, 10 and 10 per cent off; larger sizes, 60 and 10 off; carriage bolts up to ¾ x 6 in., 60 and 10 off; larger sizes, 55 and 5 off; hot pressed nuts, square and hexagon tapped, $3.75 off; blank nuts, $4 off; coach or lag screws, gimlet points, square heads, 65 and 5 per cent off. Quantity extras are unchanged.

**Structural Material.**—While unsettled labor conditions in the building trades are holding back much work in Chicago, this center being less active than others, prospective closing of some important projects offer hope of larger business for spring. Costs aside from labor seem well liquidated and successful establishment of the open shop will lend encouragement. Bids on the warehouse at Louisville for the Belknap Hardware & Mfg. Co. have been deferred to Jan. 30. Recent Western lettings are for moderate totals and various purposes. Prices remain unchanged at 1.50c. for car material, 1.60c. to 1.75c. for general business. Recent fabricating awards include:

Bryant Junior High School, Minneapolis, Minn., 142 tons, to American Bridge Co.

United Comstock Mines Co., mill buildings, Gold Hill, Nev., 182 tons, to Minneapolis Steel & Machinery Co.

Six crude stills at Sugar Creek, Mo., for Standard Oil Co., 152 tons, to Standard Tank Car Co., Sharon, Pa.

High school building at Lawrence, Kan., 170 tons, to Federal Bridge Co.

Store building at Denver for L. R. Steel, 400 tons, reinforced concrete.

Harsh & Chapline, Northwestern Division, Craddock-Terry Co. plant at Milwaukee, 315 tons, to Lakeside Bridge & Structural Co.

City of Sheboygan, Eighth Street bascule bridge, 650 tons, to Wisconsin Bridge & Iron Co., Milwaukee (reported low bidder Dec. 1.

Pending business includes:

Sewage disposal plant, Jones Island, Milwaukee, 500 tons, bids closed Jan. 13.

Chicago Union Station headhouse and concourse, 15,000 tons, bids asked.

Los Angeles & Salt Lake Railroad, subsidiary of Union Pacific freight station, Los Angeles, Cal., 500 tons, bids in.

Putnam Department Store, Davenport, Iowa, 800 tons.

Interstate bridge, Prescott, Wis., 500 tons, bids Feb. 2; Toltz, King & Day, Pioneer Building, St. Paul, Minn., consulting engineers.

The mill quotation on plain material ranges from 1.60c. to 1.70c., Chicago. Jobbers quote 2.63c. for plain material out of warehouse.

**Cast Iron Pipe.**—Though fully 50 miles of water-mains are known to be under consideration by municipalities, inquiry for cast iron pipe is not yet active. The last week of the month is expected to yield large buying when appropriations have been made. Prices are being shaded $2 in the present lull, but are expected to stiffen on renewed inquiry. A contractor has been awarded 750 tons, but has not awarded the material to a maker. Bids will be opened Jan. 30 at St. Paul on 1500 tons, Jan. 24 on 115 tons at Lake Wilson, Minn., and Minneapolis is expected to inquire shortly for two and a half miles of 24-in. pipe, about 1700 tons.

We quote per net ton, f.o.b. Chicago, as follows: Water pipe 4-in., $47.10 to $48.10; 6-in. and above, $43.10 to $44.10; Class A and gas pipe, $4 extra.

**Coke.**—Sellers report a moderate improvement in buying and a greater willingness on the part of purchasers to contract over periods. Current consumption of foundry coke in this territory is variously estimated at from 25 to 40 per cent of normal.

**Old Material.**—Buying of heavy melting steel and similar grades last week has not been continued and except for some tonnages of malleable for foundries and a small buying by rolling mills, the market is dull. Prices are stationary and in some cases weaker. Railroad lists include the Rock Island, 4250 tons, including 1000 tons steel rails, the Chicago Great Western, 1000 tons, and the Monon 400 tons. Cast iron car wheels were quoted in error last week and have been stationary at $15.50 to $16. Other prices are unchanged.

We quote delivery in consumers' yards Chicago and vicinity, all freight and transfer charges paid, as follows:

| | |
|---|---|
| *Per Gross Ton* | |
| Iron rails | $15.00 to $16.50 |
| Relaying rails | 23.00 to 27.50 |
| Cast iron car wheels | 15.50 to 16.00 |
| Rolled or forged steel car wheels | 13.00 to 13.50 |
| Steel rails, rerolling | 12.00 to 12.50 |
| Steel rails, less than 3 ft. | 12.50 to 13.00 |
| Heavy melting steel | 11.50 to 12.00 |
| Frogs, switches and guards cut apart | 11.50 to 12.00 |
| Shoveling steel | 11.00 to 11.50 |
| Low phos. heavy melting steel | 13.50 to 14.00 |
| Drop forge flashings | 7.50 to 8.00 |
| Hydraulic compressed sheet | 7.50 to 8.00 |
| Axle turnings | 8.50 to 9.00 |
| *Per Net Ton* | |
| Iron angles and splice bars | 14.00 to 14.50 |
| Steel angle bars | 10.50 to 11.00 |
| Iron arch bars and transoms | 15.00 to 15.50 |
| Iron car axles | 19.00 to 19.50 |
| Steel car axles | 12.50 to 13.00 |
| No. 1 busheling | 8.25 to 8.75 |
| No. 2 busheling | 6.00 to 6.50 |
| Cut forge | 10.25 to 10.75 |
| Pipes and flues | 7.00 to 7.50 |
| No. 1 railroad wrought | 10.50 to 11.00 |
| No. 2 railroad wrought | 10.00 to 10.50 |
| Steel knuckles and couplers | 11.50 to 12.00 |
| Coil springs | 12.50 to 13.00 |
| No. 1 machinery cast | 13.00 to 13.50 |
| No. 1 railroad cast | 12.50 to 13.00 |
| Low phos. punchings | 11.00 to 11.50 |
| Locomotive tires, smooth | 10.00 to 10.50 |
| Machine shop turnings | 3.50 to 4.00 |
| Cast borings | 5.50 to 6.00 |
| Stove plate | 12.00 to 12.50 |
| Grate bars | 10.50 to 11.00 |
| Brake shoes | 10.50 to 11.00 |
| Railroad malleable | 11.50 to 12.00 |
| Agricultural malleable | 11.50 to 12.00 |

# Buffalo

BUFFALO, Jan. 17.

**Pig Iron.**—No. 2 plain iron is being offered through an Eastern broker for $19.50—the only departure from the $20 base price standard which Buffalo furnaces have maintained as the lowest they will go. Some good inquiries are in the market, one for 3000 tons; one for 2000 tons and several for tonnages from 250 to 500 tons. The radiator interests made their recent purchase of 7000 tons at one furnace and on lowest silicons paid $19. Inquiry holds up, but a great portion is from outside the district. Furnaces are making occasional quotations for second quarter delivery, but are reluctant to book any business beyond April 1. Operation is the same and after minor repairs the Donner Steel Co. will again operate the furnace which was banked a week ago.

We quote f.o.b. per gross ton Buffalo as follows:

| | |
|---|---|
| No. 1 foundry, 2.75 to 3.25 sil. | $20.00 to $21.00 |
| No. 2X foundry, 2.25 to 2.75 sil. | 19.50 to 20.50 |
| No. 2 plain, 1.75 to 2.25 sil. | 19.00 to 20.00 |
| Basic | 20.00 to 21.00 |
| Malleable | 20.00 to 21.00 |
| Lake Superior charcoal | 31.75 |

**Finished Iron and Steel.**—All sellers find better inquiry and only a few find an increase in actual selling. Bar and shape inquiry is brisk and in one office the size of tonnages on which prices are sought, shows improvement. The sheet market is firm at $3, although a New York State buyer offering a 500-ton order claims to have a price of $2.85 and that he is holding off for a more favorable quotation. Bolts and nuts and tin plate are extremely quiet—though in other cities tin plate is understood to be in fair demand. An inquiry for 500 tons of bars for a buyer within the district is out but has not been awarded on bids of 1.50c. No structural awards have been made—in fact, little work of any size is in immediate prospect. One structural mill has sufficient orders to keep going without seeking small business where immediate delivery is a factor.

**Warehouse Business.**—In comparison with conditions a year ago, the market is livelier. Prices are lowest, in the judgment of warehouse interests and a shading of prices on plates and sheets to be in alignment with new schedules announced last week, makes the adjustment complete.

We quote warehouse prices f.o.b. Buffalo as follows: Structural shapes, 2.65c.; plates, 2.65c.; plates, No. 8 gage, 3.35c.; soft steel bars and shapes, 2.55c.; hoops and bands, 3.15c.; blue annealed sheets, No. 10, 3.40c.; galvanized steel sheets, No. 28, 5.25c.; black sheets, No. 28, 4.25c.; cold-rolled strip steel, 5.90c.; cold-rolled round shafting, 3.55c.

**Old Material.**—Dealers are not interested in the buying desires of two mills—at present prices. Some purchases of heavy melting steel have been made, but the majority of dealers have bought this material at $15 and $16 and have no willingness to sell at $13.50. In consequence the tonnages are small. Generally, feeling is better and new prices are expected before Feb. 1. Inquiries for turnings and borings from the Youngstown and eastern Pennsylvania fields have not met with response here.

We quote dealers' asking prices per gross ton f.o.b. Buffalo as follows:

| | |
|---|---|
| Heavy melting steel | $13.00 to $14.00 |
| Low phos., 0.04 and under | 17.00 to 18.00 |
| No. 1 railroad wrought | 15.00 to 16.00 |
| Car wheels | 16.50 to 17.50 |
| Machine shop turnings | 7.50 to 8.00 |
| Cast iron borings | 7.00 to 8.00 |
| Heavy axle turnings | 10.50 to 11.50 |
| Grate bars | 12.00 to 13.00 |
| No. 1 busheling | 10.00 to 11.00 |
| Stove plate | 15.00 to 16.00 |
| Bundled sheet stampings | 8.00 to 9.00 |
| No. 1 machinery cast | 17.00 to 18.00 |
| Hydraulic compressed | 10.50 to 11.50 |
| Railroad malleable | 13.00 to 14.00 |

# St. Louis

ST. LOUIS, Jan. 17.

**Pig Iron.**—More interest is being shown in pig iron than at any time during last month, and there is a better feeling among buyers. More sales are being made and additional shipping instructions are being given against contracts. The sale is reported of 700 tons of foundry iron to a local melter, while other purchases to local melters were of carload to 200-ton lots. A central Illinois radiator corporation bought 500 tons of foundry, while a southern Illinois melter bought 60 tons, and other sales of carloads are reported. There is an inquiry out from a local melter for 300 tons of foundry iron. The market is unchanged at $19, Chicago, for Northern, although a good-sized tonnage might be had at less, and $16.50, Birmingham, for Southern iron. A Kansas City concern wants 25 tons of ferromanganese.

We quote delivered consumers' yards, St. Louis, as follows, having added to furnace prices $2.88 freight and war tax from Chicago and $5.91 from Birmingham:

| | |
|---|---|
| Northern foundry, sil. 1.75 to 2.25 | $21.88 |
| Northern malleable, sil. 1.75 to 2.25 | 21.88 |
| Basic | 21.88 |
| Southern foundry, sil. 1.75 to 2.25 | 22.41 |

**Finished Iron and Steel.**—The demand from the railroads is increasing, and a number of inquiries for iron and steel were issued during the last week, and the indications are that there will be freer buying. The Missouri, Kansas & Texas wants 200 tons of structural shapes and plates for repair work. The St. Louis & San Francisco Railway is in the market for 150 tons of shapes. The Texas & Pacific has an inquiry out for 50 tons of locomotive tires on contract. The Texas Construction Co., Dallas, is in the market for 3100 tons of 70-lb. rails. The San Antonio Public Service Co. has asked for prices on three miles of 65, 70 and 90-lb. rails, and a Pine Bluff, Ark., concern desires quotations on 70-lb. rails, without stating quantity desired. The Missouri Pacific placed an order for 1000 kegs of track spikes, dividing the order between two concerns. The United Railways Co. of St. Louis now in receivership will ask the Federal Court this month for permission to build 50 additional cars to cost $600,000. Bids are to be received shortly on St. Mary's Hospital, St. Louis County, involving 930 tons of structural shapes and 100 tons of bars. The local situation is upset by the prospect that the Building Trades Council will reject the proposal of the master builders for a reduction of 20 per cent in the base wage scale of $1.25 an hour, the carpenters' vote being 25 to 1 against the proposition.

For stock out of warehouse we quote: Soft steel bars, 2.62½c. per lb.; iron bars, 2.62½c.; structural shapes, 2.72½c.; tank plates, 2.72½c.; No. 10 blue annealed sheets, 3.47½c.; No. 28 black sheets, cold rolled, one pass, 4.15c.; cold drawn rounds, shafting and screw stock, 3.65c.; structural rivets, $3.52½ per 100 lb.; boiler rivets, $3.62½; tank rivets, 7/16 in. and smaller, 65 and 5 per cent off list; machine bolts, large, 60-10 per cent; small, 60, 10 and 10 per cent; carriage bolts, large, 55-5 per cent; small, 60 and 10 per cent; lag screws, 65-5 per cent; hot pressed nuts, square or hexagon blank, $4; and tapped, $3.75 off list.

**Coke.**—The demand for coke is increasing, sales of one by-product producer being 800 tons for the week, with scattering orders for a carload or more. There is an inquiry pending for 2000 tons of furnace coke for shipment through January and February to the Southwest. Colder weather has brought forth increased consumption and demand for domestic coke. There is some inquiry from railroads for blacksmith coke.

**Old Material.**—The market for old material is weak and unsteady and there is absolutely no trading of any description. However, prices have not declined to any appreciable extent, owing to the fact that dealers are looking for a better market in the near future and are absorbing all railroad offerings at present levels. Relaying rails are in demand and some good inquiries have developed, although no large contracts are reported closed as yet. Current railroad offerings include: Southern Railway, 8100 tons; Texas Pacific Railway, 1750 tons; Chicago, Rock Island & Pacific, 830 tons.

We quote dealers' prices f.o.b. consumers' works, St. Louis industrial district and dealers' yards, as follows:

| | |
|---|---|
| *Per Gross Ton* | |
| Old iron rails | $15.00 to $15.50 |
| Steel rails, rerolling | 11.50 to 12.00 |
| Steel rails, less than 3 ft. | 11.50 to 12.00 |
| Relaying rails, standard section | 23.00 to 28.00 |
| Cast iron car wheels | 14.00 to 14.50 |
| No. 1 heavy railroad melting steel | 10.50 to 11.00 |
| No. 1 heavy shoveling steel | 10.00 to 10.50 |
| Ordinary shoveling steel | 9.00 to 9.50 |
| Frogs, switches and guards cut apart | 10.50 to 11.00 |
| Ordinary bundle sheet | 4.50 to 5.00 |
| *Per Net Ton* | |
| Heavy axles and tire turnings | 5.00 to 5.50 |
| Iron angle bars | 13.50 to 14.00 |
| Steel angle bars | 9.00 to 9.50 |
| Iron car axles | 18.00 to 18.50 |
| Steel car axles | 13.50 to 14.00 |
| Wrought iron arch bars and transoms | 13.00 to 13.50 |
| No. 1 railroad wrought | 9.50 to 10.00 |
| No. 2 railroad wrought | 8.50 to 9.00 |
| Railroad springs | 11.25 to 11.75 |
| Steel couplers and knuckles | 11.25 to 11.75 |
| Locomotive tires, 42 in. and over, smooth inside | 8.00 to 8.50 |
| No. 1 dealers' forge | 7.00 to 7.50 |
| Cast iron borings | 5.50 to 6.00 |
| No. 1 bushelings | 8.50 to 9.00 |
| No. 1 boilers cut in sheets and rings | 7.00 to 7.50 |
| No. 1 railroad cast | 13.00 to 13.50 |
| Stove plate and light cast | 11.50 to 12.00 |
| Railroad malleable | 9.50 to 10.00 |
| Agricultural malleable | 9.00 to 9.50 |
| Pipes and flues | 7.50 to 8.00 |
| Heavy railroad sheet and tank | 6.00 to 6.50 |
| Light railroad sheet | 4.50 to 5.00 |
| Railroad grate bars | 9.50 to 10.00 |
| Machine shop turnings | 4.50 to 5.00 |
| Country mixed iron | 6.50 to 7.00 |
| Uncut railroad mixed | 7.00 to 7.50 |
| Horseshoes | 9.50 to 10.00 |
| Railroad brake shoes | 9.00 to 9.50 |

# Birmingham

BIRMINGHAM, ALA., Jan. 17.

**Pig Iron.**—By the middle of the month Birmingham pig iron was selling at $16 a ton in competitive territory, and that price was as often made as $16.50 in strictly Southern territory. One maker held for higher prices, but there was no business done above the general scale. Makers report bookings of small tonnages for prompt shipment. A lot of buying expected to have been done by sanitary pipe makers did not materialize. The lower scale of prices announced by pipe makers is credited with having provoked a temporary lull. The conviction remains that this buying will start again soon. The leading pipe interest is credited with having quietly bought a minimum of 20,000 tons at bottom prices. One maker is believed to have taken 10,000 tons. The American Radiator Co. has lately taken 2500 tons for Southern plants, which are continuously on a 100 per cent production base. Small iron tonnages continue to move to the Pacific Coast out of Mobile, 50 tons leaving this week. Several lots went into Ohio and other competitive fields last week on a base of $16. Large tonnages for that delivery could be gotten under $16, the lots entering that field at $16 being small ones.

We quote per gross ton f.o.b. Birmingham district furnaces as follows:

| | |
|---|---|
| Foundry, silicon 1.75 to 2.25 | $16.00 to $16.50 |
| Basic | 15.00 to 15.50 |
| Charcoal, warm blast | 32.00 |

**Cast-Iron Pipe.**—Sanitary pipe scale has been lowered to $37 for standard, $28 for extra heavy, $40 for fittings

and $36 for 8 to 12-in. sizes. Trade simmered down while digesting the new scale. High pressure pipe works feel confident of considerable business this spring. Base is $33.

**Finishing Mills.**—The Tennessee company continues the operation of five of its nine open-hearth furnaces, car works, rail mill and Bessemer plate, guide and bar mills. The Gulf States Steel Co. is operating three of the six open hearths and all the finishing mills. New business in wire and nails has reopened and is better than it was just before the holidays. Wire mill operations have increased over December, in which month there was a considerable drop from November and October operations. Hoop and band mills remain idle.

**Old Material.**—Cast scrap is moving with fair regularity out of yards, but steel scrap is on the dead list. Prices are unchanged from last week.

We quote per gross ton f.o.b. Birmingham district yards as follows:

| | |
|---|---|
| Steel rails | $11.00 to $12.00 |
| No. 1 steel | 10.00 to 11.00 |
| No. 1 cast | 14.00 to 15.00 |
| Car wheels | 13.00 to 14.00 |
| Tramcar wheels | 12.00 to 13.00 |
| No. 1 wrought | 12.00 to 13.00 |
| Stove plate | 11.00 to 12.00 |
| Cast iron borings | 6.00 to 7.00 |
| Machine shop turnings | 6.00 to 7.00 |

# New York

NEW YORK, Jan. 17

**Pig Iron.**—The contract for segments for the vehicular tunnel between New York and New Jersey, involving over 100,000 tons of pig iron, continues to be the leading topic of discusion among foundrymen. The largest inquiry of any foundry is for 2500 tons a month for 20 months, or 50,000 tons, and it is evident that no foundry is figuring on doing all the work. Furnaces continue to maintain a very conservative attitude and are slow to quote for delivery so far in the future. In the past when tunnel contracts have been awarded, the pig iron market has advanced, but at present the market is stationary without any tendency to advance. It is expected that a more definite attitude on the part of furnaces will be disclosed soon. The melt in the metropolitan district seems to be increasing moderately and a hopeful feeling prevails. There is very little inquiry and selling is limited. Prices show little, if any, change.

We quote delivered in the New York district as follows, having added to furnace prices $2.52 freight from eastern Pennsylvania, $5.46 from Buffalo and $6.16 from Virginia:

| | |
|---|---|
| East. Pa. No. 1 fdy., sil. 2.75 to 3.25 | $23.52 to $24.02 |
| East. Pa. No. 2X fdy., sil. 2.25 to 2.75 | 23.02 to 23.52 |
| East. Pa. No. 2 fdy., sil. 1.75 to 2.25 | 22.52 to 23.02 |
| Buffalo, sil. 1.75 to 2.25 | 24.46 to 24.96 |
| No. 2 Virginia, sil. 1.75 to 2.25 | 27.16 to 28.16 |

**Ferroalloys.**—Demand for ferromanganese is still confined to carload lots and sales of about 100 tons of the British alloy are quoted at $58.35, seaboard. Consumers are interested only in hand-to-mouth necessities. There is no activity in the spiegeleisen market nor is there any interest shown by consumers of manganese ore, quotations remaining nominally unchanged. There are signs of more activity in the 50 per cent ferrosilicon market, but quotations are unchanged. There have been sales of carload lots at prevailing prices and it is not unlikely that the week's developments will reveal the closing of some contracts for 1922 consumption. Quotations are as follows:

*Ferroalloys*

| | |
|---|---|
| Ferromanganese, domestic, delivered, per ton, | $60.00 to $63.00 |
| Ferromanganese, British, seaboard, per ton | $58.35 |
| Spiegeleisen, 20 per cent, furnace, per ton | $26.00 |
| Ferrosilicon, 50 per cent, delivered, per ton, | $55.00 to $60.00 |
| Ferrotungsten, per lb. of contained metal | 40c. to 50c. |
| Ferrochromium, 6 to 8 per cent carbon, 60 to 70 per cent Cr., per lb. Cr., delivered | 11c. to 14c. |
| Ferrovanadium, per lb. of contained vanadium | $4.50 |

*Ores*

| | |
|---|---|
| Manganese ore, foreign, per unit, seaboard | 20c. |
| Tungsten ore, per unit, in 60 per cent concentrates | $2.00 up |
| Chrome ore, 40 to 45 per cent $Cr_2O_3$, crude, per net ton, Atlantic seaboard | $20.00 to $25.00 |
| Chrome ore, 45 to 50 per cent $Cr_2O_3$, crude, per net ton, Atlantic seaboard | $30.00 |
| Molybdenum ore, 85 per cent concentrates, per lb. of $MoS_2$, New York | 50c. to 60c. |

**Finished Iron and Steel.**—With limited buying in all steel products still the rule, the steel companies are making further concessions in prices to get orders. On plates, shapes and bars 1.45c., Pittsburgh, is now a frequent quotation, and business in plates and shapes has been taken as low as 1.40c., Pittsburgh. Bars do not show such pronounced weakness, 1.45c. appearing to be the minimum. The low prices are not confined to large tonnages. A jobber's order for five carloads of steel was taken by a leading producer at 1.45c. for the shapes and 1.50c. for the bars. A competitor had quoted 1.45c., Pittsburgh, on the bars, but the order for shapes at 1.45c. was accepted only upon the condition that the bars at 1.50c. were included. Plates in lots not exceeding 100 tons have been sold at 1.45c., Pittsburgh, and in a few instances at 1.40c. Many of the mills continue to quote 1.50c. on these three products, but make their concessions later to close the business. The New York Central Railroad last week opened bids on 3000 tons of plates, shapes and bars, 500 tons of forging billets and 600 tons of wire nails and other wire products. Bids were put in in various ways, including mill and delivered prices. The Worth Steel Co. bid 1.60c., mill, on plates. The Carnegie Steel Co. bid 1.605c., Pittsburgh, on plates, shapes and bars; Cambria Steel Co. bid 1.50c., Pittsburgh, on all three products; the Alan Wood Iron & Steel Co. bid 1.61c., mill, on plates; the Donner Steel Co., 1.60c., Buffalo, on plates and small shapes, and 1.50c., Buffalo, on bars; the Lackawanna Steel Co., 1.65c., delivered West Seneca, N. Y., on plates, shapes and bars; the Bethlehem Steel Co., 1.885c., delivered Newberry Junction, Pa., on plates, shapes and bars; Jones & Laughlin Steel Co., 1.50c., Pittsburgh, on plates, shapes and bars; the Bourne-Fuller Co., Cleveland, 1.605c., Cleveland, on bars. On forging billets there were bids of $32, Pittsburgh, and $33, Buffalo, the Lackawanna Steel Co. bidding $33, delivered West Seneca, N. Y. The Alan Wood Iron & Steel Co. bid $36, f.o.b. its mill. The Bourne-Fuller Co. bid $37.10, Cleveland, and the Bethlehem Steel Co., $40.32, delivered Newberry Junction. The Youngstown Sheet & Tube Co. put in a bid of 2.50c., Youngstown, on wire nails, other makers bidding 2.50c., Pittsburgh. Inquiries for finished steel are few in number and mostly for small tonnages. Exceptions are requests for bids on 2000 tons of bars for construction work at Seattle, Wash., on which Eastern contractors are figuring, and on 1700 tons of plates for tanks for the Vacuum Oil Co., New York. Little new structural steel work is up for bids. The new projects include 500 tons for an apartment house on Seventy-fifth Street, New York; 300 tons for an apartment house on East Eighty-first Street, New York; 300 tons for a branch of the Corn Exchange Bank, New York; 500 tons for a private residence on Fifth Avenue, New York. Two sections of the new Standard Oil building will require about 4500 tons of steel. The American Bridge Co. will fabricate 300 tons for a railroad bridge in California. The Lackawanna Steel Co. will furnish 100 tons for a bridge for the Long Island Railroad. The Bethlehem Steel Bridge Co. will fabricate 1000 tons for a building at Amsterdam, N. Y.

We quote for mill shipments, New York, as follows: Soft steel bars, 1.85c. to 1.88c.; plates, 1.83c. to 1.88c.; structural shapes, 1.83c. to 1.88c.; bar iron, 1.83c. to 1.88c. On export shipments the freight rate is now 28.5c. per 100 lb., instead of 28c., the domestic rate.

**Warehouse Business.**—Business has apparently shown a slight improvement since the recent revision of prices, but while this is viewed with satisfaction, there is a feeling that it may not be permanent. Sheet prices are slightly weaker, black sheets being obtainable at 3.85 per lb. for No. 28 gage, although the usual quoted price is still 4c. per lb. Galvanized sheets can also be had at better than 4.85c. per lb. Warehouses handling electric sheets report a recent spurt of activity in this material from both small and large consumers, which were evidently unwilling to wait for mill delivery. The brass and copper market maintains an active tone and orders are reported to be slightly larger as well as more numerous. Copper screening is notable among active brass and copper items, as dealers are now beginning to stock up for spring and summer

sales. The wrought iron and steel pipe business has entered upon its dull season, January, February and early March. We quote prices on page 258.

**High Speed Steel.**—The market is inactive and prices continue weak. Producers quote from 85c. to 95c. per lb. and as low as 80c per lb. on 18 per cent tungsten high speed steel, with $1.05 per lb. still being held on some special brands.

**Cast-Iron Pipe.**—Orders come in for spring delivery from private companies in satisfactory volume and prices remain firm. Whereas a year ago many foundries had shut down ostensibly for repairs, the real reason being lack of orders. Repair shutdowns now are genuine. We quote per net ton, f.o.b., New York, carload lots, as follows: 6-in. and larger, $47.30; 4-in. and 5-in., $52.30; 3-in., $62.30, with $4 additional for Class A and gas pipe.

**Old Material.**—An eastern Pennsylvania heavy melting steel consumer reduced buying prices on the yard grade 50c. to $11 on Monday, thereby causing a corresponding reduction in the New York f.o.b. price. Borings are 50c. stronger because of a demand from several consumers. Otherwise the market is without change and lifeless.

Buying prices per gross ton, New York, follow:

| | |
|---|---|
| Heavy melting steel, yard | $7.50 to $8.00 |
| Steel rails, short lengths, or equivalent | 8.50 to 9.00 |
| Rerolling rails | 9.50 to 10.00 |
| Relaying rails, nominal | 28.00 to 30.00 |
| Steel car axles | 10.00 to 10.50 |
| Iron car axles | 18.50 to 19.00 |
| No. 1 railroad wrought | 10.50 to 11.00 |
| Wrought iron track | 8.50 to 9.00 |
| Forge fire | 5.00 to 5.50 |
| No. 1 yard wrought, long | 9.00 to 9.50 |
| Cast borings (clean) | 7.50 to 8.00 |
| Machine-shop turnings | 4.00 to 5.00 |
| Mixed borings and turnings | 4.50 to 5.00 |
| Iron and steel pipe (1 in. diam. not under 2 ft. long) | 7.00 to 7.50 |
| Stove plate | 9.00 to 10.00 |
| Locomotive grate bars | 9.00 to 10.00 |
| Malleable cast (railroad) | 8.00 to 8.50 |
| Car wheels | 10.50 to 11.50 |

Prices which dealers in New York and Brooklyn are quoting to local foundries, per gross ton, follow:

| | |
|---|---|
| No. 1 machinery cast | $16.50 to $17.00 |
| No. 1 heavy cast (columns, building materials, etc.), cupola size | 15.50 to 16.00 |
| No. 1 heavy cast, not cupola size | 14.00 to 14.50 |
| No. 2 cast (radiators, cast boilers, etc.) | 10.00 to 10.50 |

# Cleveland

CLEVELAND, Jan. 17.

**Iron Ore.**—Many consuming interests have made inquiries as to probable ore prices for 1922 in order to determine how much they should write down their ore in their inventories for income tax purposes, but sellers have not been able to give any definite information, as prices for this year have not been considered. Some consumers have stated that they will inventory their ore at at least $1 a ton below 1921 prices. A year ago, consumers cut ore values in their inventories from 50c. to $1.50 a ton below the 1920 prices and when the $1 a ton reduction was finally made, their inventories were readjusted on that basis. With the decline in pig iron and steel prices and the losses sustained by operators of steel plants and blast furnaces in 1921, ore consumers seem inclined to insist on sharp reductions in ore prices for this year. Last year was, also, very unprofitable to the mining companies and they naturally would like to keep ore prices at a point where they might expect some profit this year. However, the cost of mining was reduced last year by the various reductions of miners' wages, and a further reduction in the vessel carrying rate for ore is looked for during the coming season, and consumers are expected to ask for all the benefit of the reduced cost of mining and shipping ore.

We quote delivered lower lake ports: Old range Bessemer, 55 per cent. iron, $6.45; Old range non-Bessemer, 51½ per cent iron, $5.70; Mesabi Bessemer, 55 per cent iron, $6.20; Mesabi non-Bessemer, 51½ per cent iron, $5.55.

**Pig Iron.**—The demand for foundry iron shows some increase, but sales are almost wholly in small lots, no single orders being reported for over 300 tons. Some of the smaller foundries that consume around 50 tons of iron or less per month are buying for six months' requirements, but nearly all purchases are for only immediate requirements. One Lake furnace during the week sold 5000 tons, all in small lots and mostly for prompt shipment, but sales by other producers were lighter. Shipments show a gain over the first half of December, but the improvement in foundry conditions is only slight, apparently being more pronounced in the case of malleable foundries engaged in railroad work. On foundry iron $19 has become a more general Lake furnace price, although for shipments to consumers in close proximity to the furnace, $20 is still being obtained. A leading producing interest which has been holding to $20 for foundry iron for shipment from its Valley furnace has reduced its price to $19.50. The Ford Motor Co. is supplying foundry iron to some consumers in this territory making flywheels for Ford cars and it is understood to be charging $19.50, Detroit, for this iron. Prices on Southern foundry iron have again declined and this iron is now being freely offered at $16 of 1.75 to 2.25 per cent silicon iron.

Quotations below are f.o.b. local furnace for Northern foundry iron, not including a 56c. switching charge. Other quotations are delivered Cleveland, being based on a $1.96 freight rate from Valley points, a $3.36 rate from Jackson and a $6.67 rate from Birmingham:

| | |
|---|---|
| Basic | $20.21 to $20.71 |
| Northern No. 2 fdy., sil. 1.75 to 2.25 | 19.00 to 20.00 |
| Southern fdy., sil. 2.25 to 2.75 | 23.17 |
| Ohio silvery, sil. 8 per cent | 32.86 |
| Standard low phos., Valley furnace | 33.00 |

**Semi-Finished Steel.**—The market is very dull. One sale of 250 tons of sheet bars is reported at $29 which is the common quotation for sheet bars and slabs.

**Finished Iron and Steel.**—While there seems to be more business in prospect than during the latter part of last year, little has come out so far this month. The market lacks firmness and while the 1.50c., price which has held for some time on steel cars, plates and structural material is still the minimum quotation by most mills, concessions from this price have appeared. A further concession of $2 a ton to 1.40c. has appeared on hard steel re-enforcing bars. Very little steel has been bought by the automobile companies this month. The Ford Motor Co., which usually covers about the middle of the month for the following month's requirements, is understood to have deferred its purchases. A lake shipyard has taken a small boat requiring 600 tons of steel which has been placed and one or two ore boats are still being figured on. The Port Arthur Ship Building Co., Port Arthur, Ont., has placed 4,000 tons of steel for a lake boat ordered last month by a Canadian interest. This business went to the leading interest as an export order. The agricultural implement manufacturers are displaying little activity although some small orders are coming from this source. In structural lines, local fabricators are figuring on a warehouse for the Belknap Hardware Co., Louisville, Ky., which is the only new inquiry in structural line.

Jobbers quote steel bars, 2.36c.; plates and structural shapes, 2.46c.; No. 9 galvanized wire, 3.25c.; No. 9 annealed wire, 2.75c.; No. 28 black sheets, 3.75c.; No. 28 galvanized sheets, 4.75c.; No. 10 blue annealed sheets, 3.10c.; hoops and bands, 2.96c.; cold-rolled rounds, 3.25c.; flats, squares and hexagons, 3.75c.

**Wire Products.**—Reports of weakness in the market are frequent and it is definitely established that a concession of 10c. to $2.40 a keg has appeared on wire nails. Mention is made elsewhere of the decision to adopt an arbitrary differential on wire for Cleveland delivery in place of the present regular freight differential.

**Sheets and Tin Plate.**—The demand for sheets is rather slow and few orders are being placed for more than car lots. Many consumers are only filling in their stocks. While regular prices are being firmly held buyers are apparently skeptical about their being maintained and consequently they are not placing first quarter contracts. A weakness in tin plate has developed in that quotations have appeared based on an Ohio shipping point instead of f.o.b. Pittsburgh.

**High Speed Steel.**—In the absence of a demand, the market is weak and while 85c. per lb. is nominally the minimum quotation, it is evident that an inquiry of any size would bring out a 75c price.

**Coke.**—There is quite a little activity in car lots of

foundry coke for prompt shipment. Prices are unchanged at $4 to $4.25 for standard Connellsville makes.

**Bolts and Nuts.**—The demand for bolts and nuts has improved, now that inventories are mostly over, but orders are generally for small lots, evidently for filling in stocks. Prices are well maintained. Rivet manufacturers are getting a fair volume of small lot business and one order for 60 tons was placed by a lake shipyard, being the first order from this source for some time. The recent establishment of prices at a lower level of 2.25c. for structural and 2.35c. for boiler rivets has not stabilized prices, as concessions of $1 from these prices are reported.

**Old Material.**—The market became a little more active during the week owing to a demand from dealers who have been buying to cover against recent contracts placed by Youngstown mills for steel making scrap. There was also some demand for heavy melting steel for Massillon shipment. No further buying by consumers was reported, but some mills are expected to come into the market again around the end of the month. Some speculative buying is being done by dealers. Prices are firm on nearly all grades and there is a feeling that it would not take much of a buying movement to stiffen up the prices somewhat.

We quote per gross ton, f.o.b. Cleveland, as follows:

| | |
|---|---|
| Heavy melting steel | $12.00 to $12.50 |
| Steel rails, under 3 ft. | 12.50 to 13.00 |
| Steel rails, rerolling | 14.00 to 14.50 |
| Iron rails | 12.00 to 12.50 |
| Iron car axles | 18.00 to 19.00 |
| Low phosphorus melting | 13.00 to 13.50 |
| Cast borings | 8.60 to 9.00 |
| Machine shop turnings | 8.00 to 8.25 |
| Mixed borings and short turnings | 8.60 to 9.00 |
| Compressed steel | 9.00 to 9.50 |
| Railroad wrought | 12.00 to 12.50 |
| Railroad malleable | 12.50 to 13.00 |
| Light bundled sheet stampings | 6.00 to 7.00 |
| Steel axle turnings | 9.00 to 10.00 |
| No. 1 cast | 15.00 to 16.00 |
| No. 1 busheling | 8.25 to 8.75 |
| Drop forge flashings, over 10 in. | 7.50 to 8.00 |
| Drop forge flashings, under 10 in. | 7.50 to 8.00 |
| Railroad grate bars | 12.75 to 13.00 |
| Stove plate | 13.00 to 13.25 |
| Pipes and flues | 8.50 to 9.00 |

## Will Withdraw Differential on Wire

CLEVELAND, Jan. 17.—The freight differential of 21c. per 100 lb. on Bessemer and bright wire for Cleveland delivery will be withdrawn and in its place an arbitrary differential of 10c. or 10½c. will be established, making what would be about equivalent to using Youngstown as a basing point. This change has resulted from efforts of the Cleveland bolt and nut manufacturers who asked that Cleveland be made a basing point on bolt wire and wire rods used in their plants in order to remove the disadvantage as compared with the Pittsburgh bolt and nut makers of the 21c. freight rate from Pittsburgh to Cleveland. With the change, the Cleveland bolt and nut makers have secured half the concession they asked for on wire. No announcement as yet has been made as to what will be done in the way of fixing an arbitrary differential for Cleveland in the place of the Pittsburgh-Cleveland freight rate on wire rods, nails and some other products, but it is understood that new differentials on these products are under consideration.

## Ore Producers Will Attend Washington Hearing

At a meeting of the rate committee of the Lake Superior Iron Ore Association, held Jan. 16, plans were outlined for presenting data before the Interstate Commerce Commission in connection with the commission's general investigation of railroad freight rates. F. B. Richards, M. A. Hanna & Co., H. G. Dalton, Pickands, Mather & Co., and John A. Topping, Republic Iron & Steel Co., representing ore shippers, will present statements outlining the present condition of the iron and steel industry and point out the necessity of lower rail rates on ore. Percy Sprague, traffic manager M. A. Hanna & Co., will present a brief showing old rates on ore and the percentage of increases in the present rates. The representatives of the Ore Association will appear before the Interstate Commerce Commission either Jan. 21 or 23.

## Boston

BOSTON, Jan. 17.

**Pig Iron.**—Most eastern Pennsylvania furnaces hold to $20 or $20.50 furnace base with regular silicon differentials, but are getting comparatively little business in this territory. At least three furnaces, however, this week sold iron on a basis of $19.50 for silicon 2.25 to 2.75, and even less for No. 2 plain, and secured most of the business offered. One Buffalo furnace, holding for $20 furnace, for any grade of silicon a fortnight ago, this week sold No. 2X iron at $19.50. Another Buffalo furnace quotes $19 furnace base, and central Pennsylvania iron is obtainable at $19.50 furnace base. Because furnaces are closed and have limited stocks, and because of the limited demand, it is difficult to determine what the market on Virginia iron really is. Virginia iron unquestionably can be had at $22 furnace, which represents a decline. Alabama iron also is lower, but still not on a competitive basis in this territory with eastern Pennsylvania or Buffalo. The pig iron market in general, therefore, appears easier notwithstanding the stand taken by most eastern Pennsylvania furnaces. Sales for the week include 1,000 tons No. 2 plain, second quarter delivery, to a maker of textile machinery; 200 tons No. 2X to the American Hardware Corporation, New Britain, Conn.; 200 tons No. 2X, special analysis, to a car wheel maker; 200 tons No. 2X to a Massachusetts foundry, first quarter delivery and all eastern Pennsylvania iron, and scattering 100 ton lots Buffalo No. 2X and No. 1X, and one 200 ton lot No. 2X, first and second quarter delivery. Sales in the aggregate amount to about 2500 tons. Foundries report business as shaping up slowly.

We quote delivered at common New England points as follows, having added to furnace prices $4.06 freight from eastern Pennsylvania, $5.46 from Buffalo, $6.58 from Virginia and $10.66 from Alabama:

| | |
|---|---|
| East. Penn., silicon 2.25 to 2.75 | $24.06 to $25.06 |
| East. Penn., silicon 1.75 to 2.25 | 23.56 to 24.56 |
| Buffalo, silicon 2.25 to 2.75 | 24.46 to 25.96 |
| Buffalo, silicon 1.75 to 2.25 | 24.46 to 25.46 |
| Virginia, silicon 2.25 to 2.75 | 29.08 to 29.58 |
| Virginia, silicon 1.75 to 2.25 | 28.58 to 29.08 |
| Alabama, silicon 2.25 to 2.75 | 27.16 to 27.66 |
| Alabama, silicon 1.75 to 2.25 | 26.66 to 27.16 |

**Warehouse Business.**—Local warehouse prices on iron and steel have been revised once more. This time steel half rounds, ovals, half ovals and bevels are 83½c. per 100 lb. base higher; steel bands 15c. to 30c., blue annealed sheets 25c., cold-rolled steel 20c., and most of the other kinds carried 16½c. lower. No change is noted in black and galvanized sheets. Broken stocks of certain kinds of iron and steel are beginning to develop. For the first time since the week before Christmas, a real improvement in the demand is noted. The market is not active, however. Some firms quote stove bolts at 75 and 10 per cent discount and others 80 per cent. Movement of all kinds of bolts and nuts out of stock is better. Local chain quotations have been reduced to conform with a cut of $3 to $10 a ton in manufacturers' lists. Most everybody has marked up cap screws 5 per cent.

Jobbers now quote: Soft steel bars, $2.55½ per 100 lb. base; flats, $3.05½; concrete bars, stock lengths, $2.55½; structural angles and beams, $2.65½; plates, $2.65½ to $2.83; tire steel, $3.85 to $4.25; open hearth spring steel, $4.50; crucible spring steel, $11.50; bands, $3.15½ to $3.53; hoop steel, $3.15½; cold rolled steel, $3.55 to $4.05; toe calk steel, $8; refined iron, $2.55½ per 100 lb. base; best refined iron, $4.25; Wayne iron, $5.50; Norway iron, $5.50; No. 10 blue annealed sheets, $3.48 per 100 lb. base; No. 28 black sheets, $4.50; No. 28 galvanized sheets, $5.50.

**Finished Iron and Steel.**—The Boston & Albany Railroad has purchased $50,000 to $55,000 worth of frogs and switches, 5,000 kegs of spikes, 2,700 kegs of track bolts and a miscellaneous lot of maintenance equipment. No sizable tonnages of structural steel were placed this week, but prospects are more numerous and large awards are expected within the next fortnight. On one 400-ton Boston job, as low as $55 delivered on the work, was bid, but a change in specifications has delayed an award. At least one mill has accepted small shape business at 1.45c. Pittsburgh base, and bars have been sold in this territory as low as 1.45c., but generally speaking mills are maintaining 1.50c., and occasionally securing a little better. Rail business from the smaller New England railroads is expected shortly.

The Worcester, Mass., works American Steel & Wire Co, production is 55 to 60 per cent of normal, or 15 to 20 per cent above the 1921 average. Approximately 5,000 are employed.

**Coke.**—More small consumers of by-product foundry coke have contracted for first half requirements at price ruling on date of shipment, but actual shipments from New England ovens show little, if any, improvement, because of the low operating ratio of the average foundry in this territory. Both the New England Coal & Coke Co. and the Providence Gas Co. are quoting foundry coke on a basis of $10.40 delivered where the local freight does not exceed $3.40.

**Old Material.**—The Crompton & Knowles Loom Works, Worcester, Mass., is in the market for 2,000 tons No. 1 machinery cast for second, third and fourth quarter delivery at or about $18 delivered, and will pay spot cash. Because of limited supplies, few dealers want to sell for delivery so far ahead. One 100-ton lot of No. 1 machinery, prompt delivery, sold this week at $18.25 delivered Massachusetts point. Most owners of textile machinery scrap want $18.50 to $19 delivered. Dealers continue to report more or less invisible buying of machinery cast by foundries from local or nearby yards, but the big market is quiet. Eastern Pennsylvania interests are in the market for a round tonnage of skeleton scrap at $9.75 delivered, but has had no offers, and efforts to buy forge fire scrap and stove plate, eastern Pennsylvania delivery, at prices under those quoted here, have been unavailing. Dealers are offering $8.10, including tax, f.o.b. New England shipping point, for chemical cast iron borings, but securing little. In fact, both kinds of cast iron borings are in limited supply and the strongest thing in the old material price list to-day.

The following prices are for gross ton lots delivered consuming points:

| | |
|---|---|
| No. 1 machinery cast | $17.50 to $18.50 |
| No. 2 machinery cast | 15.50 to 16.50 |
| Stove plate | 15.00 |
| Railroad malleable | 13.00 to 13.50 |

The following prices are offered per gross ton lots f.o.b. Boston rate shipping points:

| | |
|---|---|
| No. 1 heavy melting steel | $8.00 to $8.25 |
| No. 1 railroad wrought | 10.50 to 11.00 |
| No. 1 yard wrought | 9.50 to 10.00 |
| Wrought pipe (1-in. in diam., over 2 ft. long) | 7.00 to 7.25 |
| Machine shop turnings | 3.50 to 4.00 |
| Cast iron borings, rolling mill | 7.00 to 7.50 |
| Cast iron borings, chemical | 7.50 to 8.00 |
| Blast furnace borings and turnings | 3.50 to 3.75 |
| Forged scrap and bundled skeleton | 4.50 to 5.00 |
| Street car axles and shafting | 10.50 to 11.00 |
| Car wheels | 11.50 to 12.00 |
| Rerolling rails | 10.00 to 10.50 |

# Cincinnati

CINCINNATI, Jan. 17.

**Pig Iron.**—There was very little change in the market during the week but the prospects, in the opinion of most sellers, are more promising. In the southern section, on very little activity, the price has receded another 50c. a ton, and is now generally quoted at $16, Birmingham. One Southern furnace, with a freight advantage over Birmingham, is quoting $16, furnace, making the delivered price in Cincinnati $20.12. This can hardly be considered the market on Southern iron, however. There are evidences that Southern prices are firming up, as last week furnaces were turning down without consideration all offers under $16. The feature of the market is undoubtedly the inquiry of the American Brake Shoe Co., which operates one of its plants near Cincinnati, for 2500 tons a month for 20 months, delivery to commence May 1. A Cincinnati melter is inquiring for 1000 tons of foundry iron for first half shipment and a Louisville melter is in the market for 500. A Dayton melter is inquiring for 250 and the American Car & Foundry Co. a similar amount for its Huntington, W. Va., plant. A car wheel manufacturer is inquiring for 200 tons of charcoal for its Louisville plant. Other inquiries are mostly for carload lots, though occasionally 100 tons are specified. Sales include 250 tons of Southern iron to a Southern Railroad, and a similar tonnage to an Indiana manufacturer, both at $16, Birmingham. A local melter bought 150 tons, another 100 tons, and a nearby melter 100 tons of malleable. Some sales of ferroalloys were also reported at regular schedules. Several hundred tons of Southern iron, in small lots, were disposed of by the furnace mentioned above, on the basis of $15.60, Birmingham.

Based on freight rates of $4.50 from Birmingham and $2.52 from Ironton, we quote f.o.b. Cincinnati:

| | |
|---|---|
| Southern coke, sil. 1.75 to 2.25 (base) | $20.50 |
| Southern coke, sil. 2.25 to 2.75 (No. 2 soft) | 21.00 |
| Ohio silvery, 8 per cent sil | 32.02 |
| Southern Ohio coke, sil. 1.75 to 2.25 (No. 2) | 22.02 |
| Basic, Northern | 22.02 |
| Malleable | 22.52 |

**Finished Material.**—There has been little improvement in the market for finished material since the first of the year, although from reports being received the indications are that fair business will develop around Feb. 1, when inventories will be completed and jobbers and manufacturers will have a chance to see how their stocks stand. The largest order reported during the week was one for 600 tons of structural shapes for a highway bridge being erected in the Cincinnati district. Several orders for 100 tons of reinforcing bars were also booked, but with these exceptions most business was confined to carload lots. The sheet market is quiet, although there is one inquiry out for 150 tons of galvanized, which is expected to close this week. The L. & N. Railroad will close during the week on 3500 tons of splice bars and 11,300 kegs of track spikes. Competition for this order is reported to have been very keen and it is expected that some low prices will develop. There have been no changes in prices of steel. Bars, shapes, and plates are still quoted at 1.50c. and black and galvanized sheets at 3c. and 4c. respectively. The structural field is looking up nicely and a number of new projects will come up shortly. The National Biscuit Co. has acquired property on Hunt Street, Cincinnati, on which will be erected a seven-story steel building, estimated to cost with equipment, $2,500,000. Plans for this building are now being completed by John P. Zimmerman, New York, architect for the company. The directors of the Cincinnati Terminal Warehouse Co., which has an option on the plant of the Fay & Egan Co., decided at a meeting recently, to notify the Fay & Egan Co. to vacate the premises, as it is the intention to tear down the buildings preparatory to the construction of a terminal warehouse to cost $2,500,000. Taking up of the option on this property is expected to hasten the erection of the new plant of the Fay & Egan Co., plans for which are now being prepared. The county commissioners of Hamilton and Claremont counties, have decided to build a suspension bridge over the Little Miami River near Cincinnati, in which 300 tons of steel will be involved. A new hotel is also proposed for Columbus, Ohio, to have 1000 rooms and a motion picture theatre. An addition to the Longview Hospital for the Insane will likely go ahead this spring, plans having been posted by Elzner & Anderson, who will receive bids up to Feb. 13. The addition will be, of course, concrete and will cost approximately $300,000. The Pollak Steel Co. is asking bids on an addition to its Chicago plant involving 200 tons of structural steel. Plans for the Indianapolis Athletic Club, which it was expected would be ready by Jan. 16, will be sent out about Feb. 1. R. C. Daggett, Indianapolis, is the architect. The plans for the Wilde Bank Building, Indianapolis, have not been completed, but will be out shortly. There will be very little change in plant operations during the week. The jobbing mills of the American Rolling Mill Co. will be idle, although the Eastside works will be running at about 60 per cent. The Zanesville Works are continuing on a 50 per cent basis. Whitaker-Glessner Works at Portsmouth, is on a 40 per cent basis and improvement is being shown at the plant of the Newport Rolling Mill Co. at Newport, Ky., where a strike is in progress. The Louisville & Nashville Railroad has closed for 11,700 kegs of spikes with a Pittsburgh mill at $2.15 per keg.

**Warehouse Business.**—During the past few days, local jobbers report a very healthy improvement in business and the sales made are entirely satisfactory. Local jobbers have reduced prices on steel bars, shapes, plates, cold rolled, and hoops and bands, $3 a ton. Prices on sheets remain unchanged. Prices on wire

products were recently reduced $3 a ton. The new prices follow:

Iron and steel bars, 2.75c. base; hoops and bands, 3.35c. base; shapes and plates, 2.85c. base; reinforcing bars, 2.82½c. base; cold rolled rounds, 1½ in. and larger, 3.50c. base; under 1½ in. and flats, squares and hexagons, 4c.; No. 10 blue annealed sheets, 3.60c.; No. 28 black sheets, 4.25c.; No. 28 galvanized sheets, 5.25c.; wire nails, $3.00 per keg base; No. 9 annealed wire, $2.85 per 100 lb.

**Coke.**—Some activity in the coke market was reported and some contracting is going on, but usually in small amounts. A local sales agent booked one order for 2000 tons, one for 1500, and one for 1200, for delivery during the year. Prices are unchanged.

**Old Material.**—Very little activity is reported in the scrap market. A pipe company in this district is reported to have bought some cast scrap at the current market, but with this exception the market was quiet, and ruling quotations are unchanged.

We quote dealers' buying prices, f.o.b. cars:

| | *Per Gross Ton* | |
|---|---|---|
| Bundled sheets | $3.50 to | $4.00 |
| Iron rails | 12.00 to | 12.50 |
| Relaying rails, 50 lb. and up | 25.00 to | 26.00 |
| Rerolling steel rails | 10.50 to | 11.00 |
| Heavy melting steel | 9.00 to | 9.50 |
| Steel rails for melting | 9.00 to | 9.50 |
| Car wheels | 12.00 to | 13.00 |
| *Per Net Ton* | | |
| No. 1 railroad wrought | 8.50 to | 9.50 |
| Cast borings | 3.00 to | 3.50 |
| Steel turnings | 2.00 to | 2.50 |
| Railroad cast | 12.00 to | 12.50 |
| No. 1 machinery | 13.50 to | 14.50 |
| Burnt scrap | 7.50 to | 8.00 |
| Iron axles | 15.50 to | 16.50 |
| Locomotive tires (smooth inside) | 9.50 to | 10.00 |
| Pipes and flues | 4.00 to | 4.50 |

# Philadelphia

PHILADELPHIA, Jan. 17.

A slight improvement in demand for steel and pig iron has developed within the past week, but the change for the better is so small that it is yet too early to say whether it is the beginning of a gradually broadening business. Singularly, the betterment has been noted mostly in plates, which have suffered from lack of demand more than any steel product. One Eastern plate mill last week did the best business in many weeks. The Alan Wood Iron & Steel Co. is able this week to start its plate mill, which has been idle for some time, on a two or three weeks' schedule. In pig iron the better demand is not notable, but is indicated chiefly by a larger number of small inquiries. The tendency of all consumers to buy in very meager lots is probably due partly to the imminence of the Interstate Commerce Commission hearings on iron and steel freight rates, scheduled to be held next Saturday and Monday in Washington. That a possible reduction in freight rates is not considered by all buyers, however, is shown by a few inquiries which have come out for second quarter iron requirements. In fact, one or two second quarter sales have been made.

Although pig iron prices remain firm, steel business is being done very largely at the expense of prices. Some of the Eastern steel companies are adhering rigidly to 1.50c., Pittsburgh, on plates, shapes and bars, but 1.40c., Pittsburgh, has been done on plates, when the tonnages were attractive, and 1.45c. is comparatively easy on all three products. Bar iron is also offered now at 1.45c., Pittsburgh, a reduction of $1 a ton. Shafting and screw stock is weak at 1.90c., Pittsburgh, with reports of sales as low as 1.75c. Sheets are holding firmly, except that some plate mills are offering heavier gages of blue annealed at $1 or $2 a ton below the 2.25c. quotation of regular blue-annealed makers.

The Interstate Commerce Commission has ordered an increase of 20c. per net ton in the freight rate on finished steel from Pittsburgh to Philadelphia, the new rate being 0.36c. instead of 0.35c. per lb. The Baltimore rate, which was 0.335c. per lb., is increased to 0.35c. The change is made to re-establish the relationship which existed in rates from Pittsburgh to Eastern points prior to the 40 per cent rate advance in August, 1919.

**Pig Iron.**—A few inquiries for foundry iron for second quarter constitute the only new feature of the local pig iron market. While some furnaces are still averse to selling that far ahead, others are willing to quote, and have done so, their prices being practically the same as those for first quarter. A different situation exists, however, in regard to quoting on 75,000 tons of iron required for the cast iron segments for the New York-New Jersey vehicular tunnel. Practically all of the Eastern furnaces have been asked by various contractors to bid on the iron, but with one or two exceptions the furnaces are not willing to do so, at least not on a basis that would be satisfactory to the bidding contractors. The deliveries will extend over two years, at about 3000 tons a month, and some furnace operators fear they are standing too great a chance of loss to take business over such a long period at to-day's prices. Furnaces in this district are adhering to $20, furnace, for No. 2 plain, $20.50 for No. 2X and $21 for No. 1X, except that concessions of about 50c. a ton have been made in some instances to equalize freight rates, the same furnaces, however, quoting their regular prices where they encounter no freight rate disadvantage. A northern New Jersey melter bought 500 tons of No. 2X at $21, delivered, but the freight rate was only 70c. A New England melter is reported to have bought 1000 tons from an eastern Pennsylvania furnace for second quarter shipment. An inquiry for 800 tons of foundry grades for second quarter is in the market, also an inquiry for 250 to 500 tons of gray forge. Most of the current inquiries are for small lots, but the number of these inquiries is greater than in the week previous.

The following quotations are, with the exception of those on low phosphorus iron, for delivery at Philadelphia, and include freight rates varying from 84 cents to $1.54 per gross ton:

| | |
|---|---|
| East. Pa. No. 2 plain, 1.75 to 2.25 sil. | $20.84 to $21.26 |
| East. Pa. No. 2X, 2.25 to 2.75 sil. | 21.34 to 21.76 |
| Virginia No. 2 plain, 1.75 to 2.25 sil. | 27.24 to 27.74 |
| Virginia No. 2X, 2.25 to 2.75 sil. | 27.74 to 28.24 |
| Basic delivery eastern Pa. | 20.25 |
| Gray forge | 20.50 to 21.50 |
| Malleable | 23.00 to 24.00 |
| Standard low phos. (f.o.b. furnace) | 30.00 |
| Copper bearing low phos. (f.o.b. furnace) | 28.00 |

**Ferroalloys.**—The Jones & Laughlin Steel Co., Pittsburgh, has bought 20,000 tons of Brazilian manganese ore at 22c. per unit, Atlantic seaboard, and will make its own ferromanganese. This is the first important sale of manganese ore in some time. Ferromanganese is still quoted by Eastern producers and the British selling agents at $58.35, seaboard. A steel company in the Chicago district imported British alloy at $58.35, New Orleans, the delivered price at its mill being below the Steel Corporation quotation of $60, Pittsburgh. Spiegeleisen is quoted at $25, furnace, and some sales have been made below that figure.

**Rails.**—The Southern Railway will receive bids up to Friday, Jan. 20, on 26,600 tons of 85-lb. rail and 8500 tons of 100-lb. rail; also on 18,000 rail joints.

**Billets.**—Open-hearth rerolling billets are now quoted freely at $28, Pittsburgh, and forging billets at $32, Pittsburgh. There are few sales.

**Plates.**—Boiler manufacturers on the Great Lakes have placed orders in the past week for boiler plate for stock, it probably being their intention to build boilers now for the spring fitting out of lake vessels. This business has helped out one Eastern plate mill to a considerable extent, the company counting its last week's business as the best in some time. Plate prices are weak, and though most of the mills quote 1.50c., Pittsburgh, some adhering rigidly to this price, others have accepted attractive lots as low as 1.40c., while 1.45c. is rather a common figure on current business. The Cramp shipyard has inquired for about 6000 tons of plates.

**Structural Material.**—The largest structural job awarded in Philadelphia recently is the Museum of Art building, requiring 2700 tons of steel, which was awarded to the American Bridge Co. Plain material is quoted at 1.50c., Pittsburgh, but this price is sometimes shaded $1 or $2 a ton on attractive business.

**Bars.**—To meet quotations of 1.45c. on steel bars, now a rather common figure, iron bar makers have also reduced their price to 1.45c., Pittsburgh. A slightly better demand for steel bars has been noted in the

past week. Cold-finished bars are quoted at 1.90c., Pittsburgh, but this has been shaded, it is reported, as much as $3 a ton.

**Sheets.**—Except for slight cutting by plate mills on heavy blue annealed sheets, the sheet prices appear to be held firmly. The concessions on blue annealed are usually $1 or $2 a ton. Regular makers of blue annealed adhere to 2.25c., Pittsburgh, and black and galvanized are firm at 3c. and 4c., respectively, base, Pittsburgh.

**Bolts, Nuts and Rivets.**—About 45,000 kegs of bolts will be required for the New York-New Jersey vehicular tunnel. Bids have been asked for by contractors who are submitting tenders on the work. The Cramp shipyard is inquiring for 325 tons of rivets and 330 tons of high tensile steel material. The Philadelphia & Reading Railroad has bought 500 kegs of structural rivets at 2.05c., Pittsburgh, a new low figure. It also bought 300 kegs of hot-pressed nuts and is in the market for a quantity of bolts.

**Warehouse Business.**—We quote steel out of stock from Philadelphia warehouses as follows, prices including delivery within the city of Philadelphia.

Soft steel bars and small shapes, 2.50c.; iron bars (except bands), 2.50c.; round edge iron, 2.80c.; round edge steel, iron finish, 1½ x ½ in., 2.95c.; round edge steel planished, 3.70c.; tank steel plates, ¼-in. and heavier, 2.75c.; tank steel plates, 3/16-in., 2.925c.; blue annealed steel sheets, No. 10 gage, 3.50c.; light black sheets, No. 28 gage, 4c.; galvanized sheets, No. 28 gage, 5c.; square twisted and deformed steel bars, 2.65c.; structural shapes, 2.60c.; diamond pattern plates, ¼-in., 4.60c.; 3/16-in., 4.785c.; ¼-in., 4.90c.; spring steel, 4.10c.; round cold-rolled steel, 3.25c.; squares and hexagons, cold-rolled steel, 3.75c.; steel hoops, No. 13 gage and lighter, 3.25c.; steel bands, No. 12 gage to 3/16-in., inclusive, 3.10c.; iron bands, 3.90c.; rails, 2.75c.; tool steel, 8c.; Norway iron, 5c.; toe steel, 4.50c.

**Old Material.**—Scrap prices are largely nominal, there being few transactions. An eastern Pennsylvania steel company has bought 1000 tons of heavy melting steel at $11.50, delivered, and another plant has taken 500 tons of a slightly better quality at $12, delivered. A Delaware steel plant has bought 500 tons or more of cast iron borings at $12.50, delivered. We quote rerolling rails at $15.50 to $16, delivered. Quotations for delivery at consumers' works in this district are as follows:

| | |
|---|---|
| No. 1 heavy melting steel | $11.50 to $12.00 |
| Scrap rail | 11.50 to 12.00 |
| Steel rails, rerolling | 15.50 to 16.00 |
| No. 1 low phos., heavy 0.04 and under | 17.00 to 18.00 |
| Car wheels | 16.50 to 17.00 |
| No. 1 railroad wrought | 14.50 to 15.00 |
| No. 1 yard wrought | 12.00 to 12.50 |
| No. 1 forge fire | 10.00 to 10.50 |
| Bundled sheets (for steel works) | 9.50 to 10.00 |
| No. 1 busheling | 11.00 to 12.00 |
| No. 2 busheling | 9.00 to 10.00 |
| Turnings (short shoveling grade for blast furnace use) | 9.00 to 9.50 |
| Mixed borings and turnings (for blast furnace use) | 9.00 to 9.50 |
| Machine-shop turnings (for rolling mill and steel works use) | 9.00 to 9.50 |
| Heavy axle turnings (or equivalent) | 9.50 to 10.00 |
| Cast borings (for steel works and rolling mills) | 12.00 to 12.50 |
| Cast borings (for chemical plants) | 13.50 to 14.00 |
| No. 1 cast | 16.50 to 17.00 |
| Railroad grate bars | 14.00 to 14.50 |
| Stove plate (for steel plant use) | 14.00 to 14.50 |
| Railroad malleable | 13.50 to 14.00 |
| Wrought iron and soft steel pipes and tubes (new specifications) | 11.50 to 12.00 |
| Iron car axles | No market |
| Steel car axles | 17.00 to 18.00 |

## San Francisco

SAN FRANCISCO, Jan. 11.

**Pig Iron.**—Since the pre-holiday period, this market has continued dull, and not yet is there an apparent sign of substantial recovery in demand. No new business of any consequence has developed, with the exception of an inquiry for 350 tons of foundry pig iron, which the Southern Pacific Co. has closed. This material is of standard quality, 1.75 to 2.25 silicon. It appears that buyers had pretty liberally stocked during November and December, when prices were attractive, and now with no outstanding demand for fabricated products, have no occasion to purchase iron in conspicuous quantities. A steady business is being done for consumptive purposes, but this involves small amounts. The market appears about steady at prevailing prices, which are in the neighborhood of $27 to $30, ex ship, San Francisco, for the various qualities. The steamer Theodore Roosevelt recently delivered about 2000 tons to this port from Belgian shipping points, the iron having been sold some time ago. It is reported that there is a little demand for pig iron at Los Angeles, and Portland is said to be in the market for approximately 1000 tons.

**Cast Iron Pipe.**—After the period of good activity in November and the early part of December, business in pipe has quieted down, both from municipal and private sources. New business has been very light since Christmas. There has also been a slight softening tendency in prices, the market being estimated at around $32 base, with lower figures occasionally being reported. The city of Calexico, Cal., is in the market for 70 tons of pipe, and Monterey Park near Los Angeles has voted $225,000 bonds for a water system in which some pipe will be used. Newport Beach irrigation district will be authorized to call for bids on Jan. 11, to be received later, for the construction of a pipe line 9800 lineal ft. of cast iron 12-in. pipe.

**Finished Iron and Steel**—Thus far, the new year has not brought any indications of betterment in the Coast steel business. Possibly it is a little early yet to expect much, as jobbers and consumers are still concerned with inventories. There seems to be a hopeful feeling in the trade, it being the expectation that a few weeks will witness a marked improvement in demand. At the beginning of the year, the larger steel interests announced a 10c. reduction in prices of reinforcing and merchant bars, the former now being quoted at $2.75, San Francisco, while the latter is held at $2.65. There has been little interest in other lines, and prices are still unsettled, but appear to be steadying. Galvanized sheets are around 4c., Pittsburgh, and plates range from $1.70 to $1.75, tidewater. A few small jobs are pending, which will call for small quantities of mixed materials, and there is also reported a little inquiry for rails, but the most conspicuous prospect is the State Harbor Commission's warehouse to be erected at San Francisco, the bids for materials opening Jan. 12. For the first unit between 800 and 1000 tons of reinforcing bars will be needed.

**Coke.**—There is a fair business in coke on the Coast at present, the most notable single order coming from the Southern Pacific Co., which has just closed for 600 tons of foundry material. Smelters continue to be steady takers, and it is reported that about 2000 tons are en route from foreign points. Estimates place the delivery of English coke to smelters, covering a past period of three months, at approximately 4500 tons. The current market price on foreign material is ruling about $18 ex ship, San Francisco.

**Old Material.**—Cast iron scrap is said to be scarcer and prices have advanced a little, as high as $23 a net ton, delivered at foundry, being heard. Movement is not considerable, however, the demand being confined to small lots. Heavy melting steel is quite liberally offered at approximately $10 a gross ton, but there is very little consumptive demand, as rolling mill activity is at a minimum. The supply on the Coast has been augmented somewhat by the scrapping of the cruiser Brooklyn.

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The Barrett Adding Machine Co. has sold its business, patents and other assets to the Lanston Monotype Machine Co., Philadelphia. The purchasing company manufactures the monotype, a composing machine for printers. The Barrett machine, it is pointed out, can be manufactured by machines, methods and men identical with those necessary to the manufacture of the monotype keyboard.

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The regular monthly meeting of the Cleveland Purchasing Agents' Association will be held Thursday, Jan. 19, at the Hotel Statler, Cleveland. The speakers of the evening will be C. W. Chabot and W. S. Epply of the Hammermill Paper Co., Erie, Pa.

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The Pennsylvania Equipment Co., 1420 Chestnut Street, Philadelphia, is in the market for 50 16 to 20-cu. yd. capacity second-hand dump cars.

## EXPORT ACTIVITY SPREADS

### Inquiries Reported From South America and Mediterranean Markets—Chili Asks Railroad Equipment Bids

NEW YORK, Jan. 17.—Export sales have slightly diminished in volume, but exporters to other markets than the Far East report a renewed interest from South America and Mediterranean countries for finished material. Despite numerous reports to the contrary, German competition is still handicapped by inability to supply the demand for iron and steel, but there are prospects that many German mills may have cleared their books by the second quarter of the year. The New York representative of a large German interest was recently offered an allotment of heavy rails at the rate of 1000 tons per month, beginning with a May shipment. This offer was made with the provision that an export license be obtainable at that time from the government. Rails and equipment are at present greatly needed by the German railroads and the government may not be inclined to permit export shipments of this material. Part of the present congestion of transportation lines in Germany is said to be caused by the large number of empty freight cars distributed over the lines and which cannot be properly handled.

The inability of German agents in the United States to obtain material, except in unusual circumstances, is marked. Recently the representative of a large interest inquired of other German representatives for about 200 tons of billets, but thus far has been unable to obtain them from this source. An extremely satisfactory pipe inquiry from the South is reported to have been lost by several German representatives because of inability to obtain material.

German competition in machine tools and machinery is reported to be stronger and some firms are seeking representation in the United States. It is reported from Spain that the Minister of War has awarded a contract for machine tools and other equipment for an arsenal to the value of about 40,000,000 pesetas (about $6,000,000) to German manufacturers. The arsenal is believed to be near Madrid and the equipment is in line with the Spanish Government's intention of prosecuting the Moroccan campaign with renewed vigor. There were some bids submitted by American sellers of machine tools.

The Canadian Pacific Railway, it is said, is considering the appropriation of about $25,000,000 for road extensions and other improvements during the current year, most of the work to be done on western lines.

The Waterloo Chemical Works, Sydney, New South Wales, will probably establish a plant at Hobart, Tasmania, for the electrolytic manufacture of pigments from scrap iron, according to the trade supplement of the *Times*, London. The removal of the company's plant from Sydney to Hobart, will be undertaken because of the cheap hydroelectric power available at the latter place.

A group of hydroelectric companies is contemplated near St. Etienne and Grenoble in France, the group to operate under the name of the Societe de Transport d'Energie du Centre. Four main lines of transmission will be constructed, two within the next four years. They will be of 50 cycles, 10,000 to 150,000 volts.

The Department de Materiales y Almacenes, Alamenda Station, Santiago, Chile, has issued specifications for bids on the following equipment for the Chilean State Railways: Cars (23), boilers, electric machinery, lamps, etc., tin and lead in ingots, bars, iron and steel tubes, bids to be opened Feb 4, in Santiago. On Feb. 16, bids will be opened in Santiago on a tonnage of fish-plates and chairs for rails. Bids have been placed in the hands of British sellers through the British Legation in Chile and have been issued to American makers through the office of the Chilean State Railways, 141 Broadway, New York.

## British Iron and Steel Market

### Drastic Price Cuts in Pig Iron and in Steel Have Virtually Stopped Continental Competition —Sheets and Tin Plate Weaker

(*By Cable*)

LONDON, ENGLAND, Jan. 17.

Cleveland pig iron prices have been reduced. Two additional furnaces have been blown in. The position looks brighter, as there is a fair amount of inquiry for both home and export business. Continental competition has now virtually ceased. Hematite is more active, as Wales and Sheffield are buying. There is some export inquiry, for which iron makers are competing keenly. Prices are falling.

Foreign ore is quiet. Bilbao Rubio is held at 26½s. ($5.59) ex-ship, Tees. Germany is negotiating for large Newfoundland contracts.

Durham coke is weak.

Cheap sellers of English finished steel have shown an inclination to stiffen prices as their order books fill up. Most English makers of plates and angles refuse concessions. Scottish works, generally, are resuming operations this week.

Continental business is slow, owing to delays in shipments. Belgian merchant bars are quoted at £7 10s. to £7 15s. (1.41 to 1.46c. per lb.) f.o.b., for March and April delivery. Belgian ¼-in. plates are being held at £8 (1.52c. per lb.) f.o.b., March and April. Belgian beams are quoted at £9 14s. (1.83c. per lb.) delivered, Midlands.

German ¼-in. plates are quoted at £7 15s. to £8 (1.46 to 1.52c. per lb.) f.o.b., March and April shipment. German wire rods are held at £8 15s. ($36.93) f.o.b., for March and April.

Continental basic pig iron is not quoted. Foundry pig iron is held at 100s. ($21.10) f.o.b.

Tin plate in prompt position is easier, due to the fall in price of sheet bars. As the demand is not sufficient to absorb current output, some mills have already ceased rolling. There is a fair export business. Japan and the Far East are inquiring. Domestic buyers are purchasing odd sizes.

Galvanized sheets are weaker. There is some demand from India, South America and the Far East, but prices are still above buyers' ideas.

France is buying good quantities of black sheets. The Far East is inquiring, but little business is moving.

We quote per gross ton, except where otherwise stated, f.o.b. maker's works, with American equivalent figured at $4.22 per £1 as follows:

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Durham coke, delivered.. | £1 | 5s. | to | £1 | 7s. | | $5.28 | to | $5.70 |
| Cleveland No. 1 foundry. | 4 | 15 | | | | | 20.05 | | |
| Cleveland No. 3 foundry. | 4 | 10 | | | | | 18.99 | | |
| Cleveland No. 4 foundry. | 4 | 7½ | | | | | 18.46 | | |
| Cleveland No. 4 forge.... | 4 | 10 | | | | | 18.99 | | |
| Hematite ..... | 7 | 0* | | | | | 29.54* | | |
| East Coast mixed..... | 4 | 15 | to | 4 | 17½ | | 20.05 | to | 20.57 |
| Ferromanganese ..... | 15 | 0 | & | 14 | 10* | | 63.30 | & | 61.19* |
| Rails, 60 lb. and up..... | 8 | 0 | to | 9 | 10 | | 33.76 | to | 40.09 |
| Billets ..... | 7 | 10 | to | 7 | 15 | | 31.65 | to | 32.71 |
| Sheet and tin plate bars. | | | | | | | | | |
| Welsh ..... | 7 | 5 | to | 7 | 7½ | | 30.60 | to | 31.12 |
| Tin plate, base box..... | 0 | 19¼ | to | 0 | 19¾ | | 4.06 | to | 4.17 |
| | | | | | | | C. per Lb. | | |
| Ship plates ..... | 9 | 0 | to | 10 | 10 | | 1.70 | to | 1.98 |
| Boiler plates ..... | 12 | 10 | to | 14 | 0 | | 2.35 | to | 2.64 |
| Tees ..... | 9 | 10 | to | 11 | 0 | | 1.79 | to | 2.07 |
| Channels ..... | 8 | 15 | to | 10 | 5 | | 1.65 | to | 1.93 |
| Beams ..... | 8 | 5 | to | 10 | 0 | | 1.55 | to | 1.88 |
| Round bars, ¾ to 3 in... | 10 | 10 | | | | | 1.98 | | |
| Galvanized sheets, 24 g.. | 16 | 0 | to | 16 | 5 | | 3.01 | to | 3.06 |
| Black sheets ..... | 13 | 0 | | | | | 2.45 | | |
| Steel hoops ..... | 12 | 0 | & | 12 | 5* | | 2.26 | & | 2.31* |
| Cold rolled steel strip, 20 g. | 24 | 5 | | | | | 4.57 | | |

*Export price.

# PERSONAL

Roland Gerry, a director of the Jones & Laughlin Steel Co., and manager of sales of the cold-rolled department, has been advanced to the position of special

ROLAND GERRY

WILLIAM B. TODD

sales representative of the company for the United States and Canada, effective Feb. 1. Mr. Gerry will be succeeded by William B. Todd, at present vice-president of the Union Drawn Steel Co., Beaver Falls, Pa. Mr. Gerry has been with the company 41 years, rising through the sales department in successive grades to the new and responsible position he is about to occupy. Mr. Todd has been with the Union Drawn Steel Co. for 20 years, having entered its employ through the mill office in 1901 and been advanced through various departments to the vice-presidency. Mr. Todd attended the public schools of Beaver Falls and later Geneva College, a member of the following clubs and associations in Beaver Falls, Pittsburgh, Philadelphia and New York: The Tamaque Club, the Kiwanis Club, the Union Club, the Traffic Club, the Beaver Valley Club, of which he is president; the Society of Automotive Engineers, American Iron and Steel Institute, secretary of the Manufacturers Association of Beaver County and a member of the executive committee of the Pennsylvania Manufacturers Association.

George H. Mueller has become associated with the Pawling & Harnischfeger Co., Milwaukee, Wis., manufacturer of electric cranes, machine tools and excavating machinery. For a time Mr. Mueller will devote his attention to the study of the company's sales promotion and organization problems, after which he will take over the direction of the company's sales department as general sales manager. Mr. Mueller is an engineer and a graduate of Purdue and Cornell universities. For about five years he was identified directly and indirectly with the Link Belt Machinery Co., Chicago, as engineer, salesman, and district representative. In 1906 he became connected with the Jeffrey Mfg. Co., Columbus, Ohio, with which organization he was chief engineer, assistant sales manager, and New York manager, over 11 years. In the early part of 1917 he joined the Curtiss Aeroplane & Motor Corporation, Buffalo, where he served as managing engineer during the war. In 1919 he became identified with the J. I. Case Plow Works Co., Racine, Wis., as manager of service. Just before joining the Pawling & Harnischfeger organization Mr. Mueller was receiver for a plant manufacturing gas engines and gas engine-driven machinery.

F. M. Feiker, who went to Washington eight months ago as assistant to Secretary of Commerce Hoover on leave of absence from the McGraw-Hill Co., New York, has resigned, the Department of Commerce announces. Mr. Feiker has been appointed a special agent of the Bureau of Foreign and Domestic Commerce to continue in a consulting capacity the work that he has been doing in reorganizing the work of the department in its contacts with business.

O. H. Wharton, vice-president in charge of sales and also a director the Crucible Steel Co. of America, has resigned.

J. N. Klock has been elected president of the Auto Machine Co., Holland, Mich.; W. J. Banyon, vice-president; H. S. Gray, secretary; R. C. Eisley, treasurer and general manager.

C. R. Scarborough, New York, president Home Sewing Machine Co., Orange, Mass., and Harvey S. Dawley, treasurer, have retired, and have been succeeded by DeForest Candee.

C. A. Pfeffer has resigned as president of the Saxon Motor Car Co., Detroit, with which organization he has been connected for three years.

J. R. Blakeslee, president Ajax Mfg. Co., forging machinery, Cleveland, has sailed for Europe on a two months' business trip.

Henry B. Plumb, New York, treasurer Eagle Lock Co., Terryville, Conn., has been elected president of that company to succeed his brother, the late Rollin J. Plumb.

Robert H. Spahr, director of education Winchester Repeating Arms Co., New Haven, Conn., has been made instructor in foremanship of the Springfield, Mass., division, Northeastern University.

John D. Hibbard has resigned as commissioner of the National Metal Trades Association, with headquarters at Chicago. The resignation was accepted by the

HOMER D. SAYRE

JOHN D. HIBBARD

executive committee at the request of Mr. Hibbard, who desired to be relieved of the responsibilities of the office at this time. He has been commissioner since December, 1912, when he succeeded Robert Wuest. During his term of office the membership of the association has grown from 732 to 1013. Mr. Hibbard will continue to be identified with the association in an advisory capacity. Homer D. Sayre, secretary, has been appointed commissioner to succeed Mr. Hibbard. A graduate of the law school of DePaul University, Chicago, Mr. Sayre has been with the National Metal Trades Association in various positions since March, 1907. Louis W. Fischer has been appointed secretary to take the place made vacant by Mr. Sayre's promotion. Mr. Fischer has been with the association for three years and prior to that had both legal and business training. A graduate of the law school of DePaul University, Chicago, he was for six years assistant to the judge of the Appellate Court for the First District of Illinois, at Chicago.

Charles E. Stuart, secretary and treasurer Central Steel Co., Massillon, Ohio, has been elected president of the Massillon Chamber of Commerce. Among other new officers of the chamber are E. H. Nelson, general manager Griscom-Russell Co., who was named first vice-president, and E. H. Birney, president Peerless Drawn Steel Co., who was elected second vice-president.

C. C. Upham, formerly vice-president Diebold Safe

& Lock Co., Canton, Ohio, has been elected chairman of the board of directors of that company and in his new capacity has assumed active management of the company's affairs.

Roy D. Tyler, a specialist on indoor transportation systems, became associated with the Standard Conveyor Co. of North St. Paul, Minn., recently. For seven years he had been with Montgomery Ward & Co. as engineer of construction and equipment of all plants and general superintendent of the Chicago plant.

H. W. Cross, formerly of the General Electric Co., has assumed management of the New England office at 53 State Street, Boston, of the C. H. Wheeler Mfg. Co., condensers, pumps and cooling towers, Philadelphia.

C. H. Davies has severed his connection with the S. F. Bowser Pump & Tank Co., with whom he has been associated for 16 years. For many years he was advertising manager and was editor of its house organ. Until recently he was in charge of the promotion of factory sales, with headquarters in Chicago. Mr. Davies has already taken up his new duties with the Citrus Products Co., Chicago, and will be in charge of advertising and marketing.

F. A. Coleman, who has been engaged in the design and manufacture of foundry equipment for the past 17 years, recently resigned as vice-president and general manager of the Foundry Equipment Co., Cleveland. He is now located at 1951 East Fifty-seventh Street, Cleveland.

L. A. de Marrais, who was formerly with J. N. Kinney, 30 Church Street, New York, is now in charge of sales of Ohio locomotive cranes and electric cranes of the Bedford Foundry & Machine Co., for J. N. Kinney.

E. G. Howell, assistant treasurer and assistant to the general manager in the sales department, Briggs & Turivas, Inc., scrap iron and steel broker, Chicago, has resigned to join the sales force of Hickman, Williams & Co., dealers in pig iron, alloys and scrap, Chicago. Mr. Howell was with Briggs & Turivas, Inc., for three and one-half years, and prior to that time was for 14 years connected with the Republic Iron & Steel Co. C. M. Stowe, who recently resigned from the sales force of Hickman, Williams & Co., has become identified with the Holland Furnace Co., Holland, Mich., and will be assigned to that company's Cedar Rapids, Iowa, plant. The position left vacant by Mr. Howell at the Briggs & Turivas offices will be filled by Frank Garrett, who has been connected with the company for five years in an outside capacity.

Zeno D. Barns has been appointed manager of the Cleveland office, 429 Schofield Building, of the Ajax Metal Co., Philadelphia, succeeding the late Louis E. Purnell. The Cleveland office covers the states of Ohio and Michigan. Mr. Barns for some years past has been connected with the Westinghouse Electric & Mfg. Co. and the Westinghouse Air Brake Co.

Edward Francis Carry, president Haskell-Barker Car Co., Michigan City, Ind., recently purchased by the Pullman Co., was made president of the combined concern on Jan. 16. J. S. Runnels, retiring president of the Pullman Co., becomes chairman of the board. Mr. Carry started his car building career at the age of 21, as stenographer for Wells & French.

## OBITUARY

THOMAS P. EGAN, president J. A. Fay & Egan Co., manufacturer of woodworking machinery, Cincinnati, died at the Good Samaritan Hospital in that city on Jan. 9, aged 74 years. He was born in Ireland and during his infancy was brought to Canada, where he attended high school. He went to Cincinnati in the early sixties where he obtained employment as a lathe hand in a brass manufacturing concern. Soon he entered the service of Steptoe-MacFarland & Co., who were at that time the pioneer manufacturers of woodworking machinery in the United States. He had been employed in their shop but two weeks when an accident caused him to lose his left arm and he was then transferred to a position in the office. Later Mr. Egan became a traveling salesman for the company. In 1884 Mr. Egan resigned and, with several associates, engaged in business for himself. The enterprise was successful and the firm soon moved into a plant on Front Street, between Central Avenue and John Street. Several years later the Egan company was organized, with a capital stock of $150,000, with Mr. Egan as president. In 1893 the Egan company was consolidated with the J. A. Fay Co. with a capitalization of $2,500,000 and Mr. Egan was elected president of the consolidated companies. The concern grew steadily until now it is considered to be the largest woodworking machinery plant in the world. Mr. Egan was one of the organizers of the National Association of Manufacturers and was its first president. He was signally honored at the meeting of this association held in New York last year. He was also the organizer of the Manufacturers Club of Cincinnati, and was a one-time president of the Chamber of Commerce of Cincinnati. Mr. Egan is survived by his wife and seven children; three sons and four daughters. All of the sons are engaged in the business founded by their father.

JOHN J. CUNNINGHAM, president and general manager Western Foundry Co., Wingham, Ont., died in Toronto recently. The deceased was well known in western Ontario and had been prominent in the manufacture of stoves for a number of years.

T. C. DILL, president T. C. Dill Machine Co., Inc., Philadelphia, died Jan. 6 of heart trouble.

ALBERT B. COATES, Coates & Tweed, Lake Superior iron ore mine owners, died Jan. 10 in Orlando, Fla., at the age of 52. His home was at Virginia, Minn. He was born in Cleveland and early in life became bookkeeper for the Avery Stamping Co., which position he left to go to Minnesota as office head for Frank Rockefeller. Coates & Tweed own mines in the Mesaba, Cuyuna and Gogebic ranges, their ore being marketed through Pickands, Mather & Co., Cleveland.

ARTHUR SEYMOUR BROWN, vice-president Ansonia branch of the American Brass Co., died Jan. 12 at his home of heart failure, at the age of 44 years.

JAMES A. BRADY, founder and until his retirement president and general manager of the James A. Brady Foundry Co., Chicago, died at his home in that city on Jan. 9, following an illness of one month. Mr. Brady was 74 years of age and was born in Jersey City, N. J. He spent his early life in New York, where he was identified with the Tammany organization under the Croker regime. At the age of 25 he became connected with the foundry business at Beaver Falls, Pa. Subsequently he went to Chicago, where for 13 years he was superintendent of the foundry of the Chicago Hardware Mfg. Co., now the Chicago Hardware Foundry Co. After leaving that company he was for seven years superintendent of the Reedy Elevator Works, now the Reedy Foundry Co., Chicago. In March, 1899, he organized the James A. Brady Foundry Co., Chicago, of which he was president and general manager up to the time of his retirement from business some ten years ago.

HENRY BARTON, superintendent of the foundry operated by the Henry E. Pridmore Co., Chicago, manufacturer of molding machines, died at his home in that city on Jan. 4. He was 61 years of age and his death was caused by heart disease.

GEORGE BALDWIN SELDEN, holder of the famous Selden patents covering gasoline propelled vehicles and a pioneer in the present automotive industry, died at Rochester, N. Y., Jan. 17, at the age of 77 years. He was president of the Selden Motor Co., Rochester. He was graduated from Yale University in 1865, studied law and was admitted to the bar in 1871. In 1879 he applied for a patent on his gasoline engine after a few years of experimenting with other fuels.

# NON-FERROUS METALS

## The Week's Prices

Cents Per Pound for Early Delivery

| | Copper, New York | | Straits Tin | Lead | | Zinc | |
|---|---|---|---|---|---|---|---|
| Jan. | Lake | Electrolytic* | New York | New York | St. Louis | New York | St. Louis |
| 11..... | 13.87½ | 13.62½ | 32.37½ | 4.70 | 4.40 | 5.12½ | 4.77½ |
| 12..... | 13.87½ | 13.62½ | 33.00 | 4.70 | 4.40 | 5.10 | 4.75 |
| 13..... | 13.87½ | 13.62½ | 33.00 | 4.70 | 4.40 | 5.10 | 4.75 |
| 14..... | 13.87½ | 13.62½ | .... | 4.70 | 4.40 | 5.10 | 4.75 |
| 16..... | 13.87½ | 13.62½ | 32.37½ | 4.70 | 4.40 | 5.12½ | 4.77½ |
| 17..... | 13.87½ | 13.62½ | 32.00 | 4.70 | 4.40 | 5.12½ | 4.77½ |

*Refinery quotation.

## New York

NEW YORK, Jan. 17.

Dullness still pervades all the markets. Buying is light but most quotations are steady. Business in tin continues moderate but prices are slightly higher. There is no change in conditions in the lead market but prices are firm. Demand for zinc is very light with but little change in quotations. Antimony is lower.

**Copper.**—Interest on the part of consumers is exceedingly light and needs for a large part of the first quarter were fully covered in the latter part of last year. There is some demand for electrolytic copper, but it is confined to the immediate needs of a few consumers here and there. The price situation is generally firm. Quotations of the leading producers are at the minimum of 13.87½c., delivered, or 13.62½c., refinery, for January and first quarter, with 14c., delivered, the minimum asking price of some of the larger producers. There are also some refiners of copper who are out of the market. It is stated that a few dealers are offering electrolytic copper at 13.75c., delivered, or 13.50c., refinery, but the amount available from this source is exceedingly small. Lake copper is quoted at 13.87½c., New York or delivered, with that market also quiet.

**Tin.**—The market for spot Straits tin is spotty. On Jan. 11 and 12 there was some activity, due to the report that the steamer Sagadahoc, with 1000 tons of Straits tin aboard, had met with an accident and was obliged to put into port for repairs, which would necessitate a delay of a month in its arrival here. This caused some fear of a shortage of tin in January and February, resulting in dealers turning buyers; on those days fairly large sales were made, estimated to amount to between 400 and 600 tons. A little business was done on Jan. 13 and yesterday pressure to sell developed which resulted in an easier market. There were sales of spot and metal on steamers afloat at 32.37½c. and some later deliveries were done at 32.25c. to 32.12½c., the total business amounting to 200 to 250 tons. To-day dealers turned buyers and the market was active and firm. On the New York Metal Exchange on Jan. 12, January shipment from the Straits, 25 tons, was sold at 33c. and 25 tons of spot standard at 32.50c. Spot Straits tin to-day was quoted at 32c. New York, and the London market was about £2 per ton lower than a week ago at £163 7s. 6d for spot standard, £165 for future standard and £165 7s. 6d. for spot Straits, with the market weak. Arrivals thus far this month have been 3015 tons with 5410 tons reported afloat.

**Lead.**—The market is firm and unchanged at 4.70c., both New York and St. Louis, as the quotation of the leading interest and with 4.40c, St. Louis, and 4.70c. to 4.75c., New York and Eastern points, as that of the outside market. New demand is fair but not large enough to affect prices.

**Zinc.**—The market is quiet and dull and demand still waits upon developments in the steel market, particularly demand for galvanized sheets. Spot and early delivery for prime Western zinc is quoted at 4.75c. to 4.80c., St. Louis, or 5.10c. to 5.15c., New York, with future business in the first quarter about five points higher for each month involved.

**Antimony.**—Wholesale lots for early delivery are slightly lower at 4.45c., New York, duty paid.

**Aluminum.**—The quotation of the leading interest for wholesale lots for early delivery continues unchanged at 19.10c. per lb., f.o.b. plant, for 15-ton lots of virgin metal, 98 to 99 per cent pure, but the same grade is obtainable from importers handling Norwegian, Swiss, British, German and Swedish metal at 17c. to 18c., New York, duty paid. There is an inquiry for 200 tons before the market.

**Old Metals.**—Business is still dull, but there is a better feeling in the market. Dealers' selling prices are as follows:

| | Cents Per Lb. |
|---|---|
| Copper, heavy and crucible | 13.25 |
| Copper, heavy and wire | 12.50 |
| Copper, light and bottoms | 10.00 |
| Heavy machine composition | 10.25 |
| Brass, heavy | 8.00 |
| Brass, light | 6.00 |
| No. 1 red brass or composition turnings | 8.25 |
| No. 1 yellow rod brass turnings | 6.25 |
| Lead, heavy | 4.25 |
| Lead, tea | 3.25 |
| Zinc | 3.00 |

## Chicago

JAN. 17.—No duller week has been seen in years in the metals, with buying practically at zero. Old metals are slightly lower in the absence of trading and dealers find nothing moving. We quote in carload lots: Lake copper, 14c.; tin, 33.50c.; lead, 4.50c.; spelter, 4.80c.; antimony, 6.50c., in less than carload lots. On old metals we quote: Copper wire, crucible shapes and copper clips, 10.50c.; copper bottoms, 8c.; red brass, 8c.; yellow brass, 5.75c.; lead pipe, 3.25c.; zinc, 2.37½c.; pewter, No. 1, 23c.; tin foil, 24c.; block tin, 26c.; all buying prices for less than carload lots.

## St. Louis

JAN. 17.—The market for lead and zinc is slightly weaker. We quote lead at 4.38c. to 4.40c., car lots, and slab zinc at 4.75c. to 4.80c. On old metals we quote: Light brass, 3.50c.; heavy red brass and light copper, 7c.; heavy yellow brass, 4c.; heavy copper and copper wire, 7.50c.; zinc, 2c.; pewter, 15c.; tin foil, 16c.; tea lead, 2c.; aluminum, 9c.

## Transfer of Jamison Coke Properties

PITTSBURGH, Jan. 16.—Official announcement of the successful conclusion of negotiations for the transfer of the Greensburg, Pa., properties of the Jamison Coal & Coke Co., to the Keystone Coal & Coke Co., was made last Saturday by Harry F. Bovard, general superintendent of the latter. All of the Jamison Coal & Coke Co. holdings in Westmoreland county, except the new mining operations on the Thaw estate at Pleasant Unity, are involved in the transaction, which gives the Keystone company undisputed control of the Greensburg basis, since the company, by the Jamison purchase, controls all the output of the basin except one or two small mines. Besides the Thaw operations retained in Westmoreland county, the Jamison company still owns two mines at Perryopolis, Pa., and 8000 acres of Pittsburgh seam coal near Fairmount, W. Va.

The formal transfer of the properties of the Jamison company will be made on Feb. 1. The principal mines which are involved are the Jamison No. 1 at Luxor, employing 350 men and producing annually 380,000 tons of coal and operating 400 beehive coke ovens; the Jamison No. 2, at Hannastown, employing 600 men and producing 440,000 tons; the Jamison No. 3, at Forbes Road, employing 325 men and producing 370,000 tons; the Jamison No. 4, at Crabtree, employing 663 men and producing 679,000 tons and operating 492 coke ovens; the Jamison No. 5, at Crabtree, employing 700 men and producing 380,000 tons, and the Jamison No. 6, near Greensburg, employing 200 men and producing 130,000 tons. The officers of the Keystone company are: President, Julian B. Huff; general superintendent, Harry F. Bovard, and directors, Messrs. Huff and Bovard, William A. Coulter, W. S. Moorhead, Richard Coulter and E. M. Gross.

# Prices Finished Iron and Steel, f.o.b. Pittsburgh

## Freight Rates

**Freight rates from Pittsburgh on finished iron and steel products, in carload lots, to points named, per 100 lb., are as follows:**

| | | | |
|---|---|---|---|
| Philadelphia, domestic | $0.35 | Kansas City | $0.815 |
| Philadelphia, export | 0.265 | Kansas City (pipe) | 0.77 |
| Baltimore, domestic | 0.335 | St. Paul | 0.665 |
| Baltimore, export | 0.255 | Omaha | 0.815 |
| New York, domestic | 0.38 | Omaha (pipe) | 0.77 |
| New York, export | 0.285 | Denver | 1.35 |
| Boston, domestic | 0.415 | Denver (wire products) | 1.415 |
| Boston, export | 0.285 | Pacific Coast | 1.665 |
| Buffalo | 0.295 | Pacific Coast, ship plates | 1.335 |
| Cleveland | 0.24 | Birmingham | 0.765 |
| Detroit | 0.325 | Jacksonville, all rail | 0.555 |
| Cincinnati | 0.325 | Jacksonville, rail and water | 0.46 |
| Indianapolis | 0.345 | New Orleans | 0.515 |
| Chicago | 0.38 | | |
| St. Louis | 0.475 | | |

The minimum carload to most of the foregoing points is 36,000 lb. To Denver the minimum loading is 40,000 lb., while to the Pacific Coast on all iron and steel products, except structural material, the minimum is 80,000 lb. On the latter item the rate applies to a minimum of 50,000 lb., and there is an extra charge of 9c. per 100 lb. on carloads of a minimum of 40,000 lb. On shipments of wrought iron and steel pipe to Kansas City, St. Paul, Omaha and Denver the minimum carload is 46,000 lb. On iron and steel items not noted above the rates vary somewhat and are given in detail in the regular railroad tariffs.

Rates from Atlantic Coast ports (i.e., New York, Philadelphia and Baltimore) to Pacific Coast ports of call on most steamship lines, via the Panama Canal, are as follows: Pig iron, 55c.; ship plates, 75c.; ingot and muck bars, structural steel, common wire products, including cut or wire nails, spikes and wire hoops, 75c.; sheets and tin plates, 60c. to 75c.; rods, wire rope, cable and strands, $1; wire fencing, netting and stretcher, 75c.; pipe, not over 8 in. in diameter, 75c.; over 8 in. in diameter, 2½c. per in. or fraction thereof additional. All prices per 100 lb. in carload lots, minimum 40,000 lb.

## Structural Material

I-beams, 3 to 15 in.; channels, 3 to 15 in.; angles, 3 to 6 in., on one or both legs, ¼ in. thick and over, and zees, structural sizes, 1.50c. to 1.60c.

Sheared plates, ¼ in. and heavier, tank quality, 1.50c.

## Wire Products

Wire nails, $2.50 base per keg; galvanized, 1 in. and longer, including large-head barbed roofing nails, taking an advance over this price of $1.25 and shorter than 1 in., $1.75; bright Bessemer and basic wire, $2.25 per 100 lb.; annealed fence wire, Nos. 6 to 9, $2.25; galvanized wire, $2.75; galvanized barbed wire, $3.15; galvanized fence staples, $3.15; painted barbed wire, $2.65; polished fence staples, $2.65; cement-coated nails, per count keg, $2.00; these prices being subject to the usual advances for the smaller trade, all f.o.b. Pittsburgh, freight added to point of delivery, terms 60 days, net, less 2 per cent off for cash in 10 days. Discounts on woven-wire fencing are 68 to 70½ per cent off list for carload lots; 67 to 69½ per cent for 1000-rod lots, and 66 to 68½ per cent for small lots, f.o.b. Pittsburgh.

## Bolts and Nuts

Machine bolts, small, rolled threads, 70, 10 and 5 to 70, 10 and 7½ per cent off list
Machine bolts, small, cut threads, 70 and 5 to 70 and 10 per cent off list
Machine bolts, larger and longer, 65, 10 and 5 to 70 and 10 per cent off list
Carriage bolts, ⅝ in. x 6 in.: Smaller and shorter rolled threads, 65, 10 and 10 per cent off list
Cut threads ..... 65 and 10 to 70 per cent off list
Longer and larger sizes ..... 65 and 10 to 70 per cent off list
Lag bolts ..... 70 and 10 to 70, 10 and 5 per cent off list
Plow bolts, Nos. 1, 2 and 3 heads .... 60 and 10 per cent off list
Other style heads ..... 20 per cent extra
Machine bolts, c.p.c. and t. nuts, ⅜ in. x 4 in.:
Smaller and shorter ..... 65 and 5 per cent off list
Larger and longer sizes ..... 65 per cent off list
Hot pressed sq. or hex. blank nuts ..... $5.50 off list
Hot pressed nuts, tapped ..... $5.00 to $5.25 off list
C.p.c. and t. sq. or hex. blank nuts ..... $5.25 off list
C.p.c. and t. sq. or hex. blank nuts, tapped ..... $5.00 off list
Semi-finished hex. nuts:
¼ in. to 9/16 in. inclusive ..... 80, 10 and 10 per cent off list
Small sizes S. A. E. ..... 80, 10, 10 and 10 per cent off list
⅝ in. to 1 in. inclusive, U. S. S. and S. A. E. 70, 10, 10 and 10 per cent off list
Stove bolts in packages ..... 80, 10 and 5 per cent off list
Stove bolts in bulk ..... 80, 10 and 7½ per cent off list
Tire bolts ..... 65, 10 and 10 per cent off list
Track bolts, carloads ..... 3c. to 3.25c. base
Track bolts, less than carloads ..... 4c. to 4.25c.

*Upset Square and Hex. Head Cap Screws*

½ in. and under ..... 80 and 10 per cent off list
9/16 in. to ¾ in. ..... 80 and 10 per cent off list

*Upset Set Screws*

½ in. and under ..... 80, 10 and 5 to 85 per cent off list
9/16 in. to ¾ in. ..... 80, 10 and 5 to 85 per cent off list

*Milled Square and Hex. Cap Screws*

All sizes ..... 75 and 10 per cent off list

*Milled Set Screws*

All sizes ..... 70, 10 and 10 per cent off list

## Rivets

Large structural and ship rivets ..... $2.25
Large boiler rivets ..... 2.35
Small rivets ..... 70, 10 and 10 per cent off list

## Wire Rods

No. 5 common basic or Bessemer rods to domestic consumers, $36 to $38; chain rods, $36 to $38; screw stock rods, $41 to $43; rivet and bolt rods and other rods of that character, $36 to $38; high carbon rods, $43 to $50, depending on carbons.

## Railroad Spikes and Track Bolts

Railroad spikes, 9/16-in. and larger, $2.15 to $2.20 base per 100 lb. in lots of 200 kegs of 200 lb. each or more; spikes, ½-in., ⅝-in. and 7/16-in., $2.25 to $2.30 base; 5/16-in., $2.25 to $2.30 base. Boat and barge spikes, $2.25 to $2.30 base per 100 lb. in carload lots of 200 kegs or more, f.o.b. Pittsburgh. Track bolts, 3c. to 3.25c. base per 100 lb. Tie plates, $2 per 100 lb. Angle bars, $2.40 per 100 lb.

## Terne Plates

Prices of terne plates are as follows: 8-lb. coating, 200 lb., $9.30 per package; 8-lb. coating, I. C., $9.60; 15-lb. coating, I. C., $11.80; 20-lb. coating, I. C., $13; 25-lb. coating, I. C., $14.25; 30-lb. coating, I. C., $15.25; 35-lb. coating, I. C., $16.25; 40-lb. coating, I. C., $17.25 per package, all f.o.b. Pittsburgh, freight added to point of delivery.

## Iron and Steel Bars

Steel bars, 1.50c. to 1.60c. from mill. Refined bar iron, 2c. to 2.10c.

## Welded Pipe

The following discounts are to jobbers for carload lots on the Pittsburgh basing card:

*Butt Weld*

| Steel | | | Iron | | |
|---|---|---|---|---|---|
| Inches | Black | Galv. | Inches | Black | Galv. |
| ⅛ | 54½ | 28 | ¼ to ⅜ | + 3½ | +22½ |
| ¼ to ⅜ | 60 | 33½ | ½ | 36½ | 18½ |
| ½ | 65 | 50½ | ¾ | 42½ | 27½ |
| ¾ | 69 | 56½ | 1 to 1½ | 44½ | 29½ |
| 1 to 3 | 71 | 58½ | | | |

*Lap Weld*

| | | | | | |
|---|---|---|---|---|---|
| 2 | 64 | 51½ | 2 | 39½ | 25½ |
| 2½ to 6 | 63 | 55½ | 2½ to 6 | 42½ | 29½ |
| 7 to 8 | 65 | 51½ | 7 to 12 | 40½ | 27½ |
| 9 to 12 | 64 | 50½ | | | |

*Butt Weld, extra strong, plain ends*

| | | | | | |
|---|---|---|---|---|---|
| ⅛ | 50½ | 33 | ¼ to ⅜ | + 4½ | +37½ |
| ¼ to ⅜ | 56 | 38½ | ½ | 35½ | 23½ |
| ½ | 62 | 50½ | ¾ | 42½ | 28½ |
| ¾ | 67 | 55½ | 1 to 1½ | 44½ | 30½ |
| 1 to 1½ | 69 | 57½ | | | |
| 2 to 3 | 70 | 58½ | | | |

*Lap Weld, extra strong, plain ends*

| | | | | | |
|---|---|---|---|---|---|
| 2 | 62 | 50½ | 2 | 40½ | 27½ |
| 2½ to 4 | 66 | 54½ | 2½ to 4 | 43½ | 31½ |
| 4½ to 6 | 65 | 53½ | 4½ to 6 | 42½ | 30½ |
| 7 to 8 | 61 | 47½ | 7 to 8 | 35½ | 23½ |
| 9 to 12 | 55 | 41½ | 9 to 12 | 30½ | 18½ |

To the large jobbing trade the above discounts are increased by one point, with supplementary discounts of 5 and 2½ per cent.

## Boiler Tubes

The following are the discounts for carload lots f.o.b. Pittsburgh:

| *Lap Welded Steel* | | *Charcoal Iron* | |
|---|---|---|---|
| 1¾ in. | 26½ | 1½ in. | 5 |
| 2 to 2¼ in. | 41 | 1¾ to 1⅞ in. | 15 |
| 2½ to 3 in. | 52 | 2 to 2¼ in. | 25 |
| 3¼ to 13 in. | 57 | 2½ to 3 in. | 30 |
| | | 3¼ to 4½ in. | 32 |

*Standard Commercial Seamless Boiler Tubes*

New discounts have been adopted on standard commercial seamless boiler tubes, but manufacturers are not yet ready to announce them for publication, and for that reason we publish no discounts this week.

## Sheets

Prices for mill shipments on sheets of standard gage in carloads, f.o.b. Pittsburgh, follow:

*Blue Annealed*

| Cents per Lb. | | Cents per Lb. | |
|---|---|---|---|
| No. 8 and heavier | 2.20 | Nos. 11 and 12 | 2.30 |
| Nos. 9 and 10 (base) | 2.25 | Nos. 13 and 14 | 2.35 |
| | | Nos. 15 and 16 | 2.45 |

*Box Annealed, One Pass Cold Rolled*

| Cents per Lb. | | Cents per Lb. | |
|---|---|---|---|
| Nos. 17 to 21 | 2.80 | No. 23 (base) | 3.00 |
| Nos. 22 to 24 | 2.85 | No. 29 | 3.10 |
| Nos. 25 and 26 | 2.90 | No. 30 | 3.20 |
| No. 27 | 2.95 | | |

*Galvanized*

| Cents per Lb. | | Cents per Lb. | |
|---|---|---|---|
| Nos. 10 and 11 | 3.00 | Nos. 25 and 26 | 3.70 |
| Nos. 12 to 14 | 3.10 | No. 27 | 3.85 |
| Nos. 15 and 16 | 3.25 | No. 28 (base) | 4.00 |
| Nos. 17 to 21 | 3.40 | No. 29 | 4.25 |
| Nos. 22 to 24 | 3.55 | No. 30 | 4.50 |

*Tin-Mill Black Plate*

| Cents per Lb. | | Cents per Lb. | |
|---|---|---|---|
| Nos. 15 and 16 | 2.80 | No. 28 (base) | 3.00 |
| Nos. 17 to 21 | 2.85 | No. 29 | 3.05 |
| Nos. 22 to 24 | 2.90 | No. 30 | 3.05 |
| Nos. 25 to 27 | 2.95 | Nos. 30½ and 31 | 3.10 |

## Trade Changes

Pneumercator Co., Inc., manufacturer of pneumatic mercury gages for measuring liquid contents of tanks and for indicating ships' draft, will move its factory from Philadelphia to the Sperry Building, 40 Flatbush Avenue Extension, Brooklyn, on Feb. 1. Its general offices will be transferred from 15 Park Row, New York, to the new factory location on that date.

The Reed-Prentice Co. and associate companies, the Becker Milling Machine Co. and the Whitcomb-Blaisdell Machine Tool Co., have removed their New York office, which is under the direction of P. K. Dayton, New York sales manager, from the Grand Central Palace, 480 Lexington Avenue, New York, to room 536, Singer Building, 149 Broadway, New York.

The Harder Furnace & Engineering Corporation announces that the sale of its licenses to use the Harder patents and the services of its engineering department will be conducted hereafter by the Fuels Utilization Corporation, which will have its offices in the Knickerbocker Building, 152 West Forty-second Street, New York. The Harder Furnace & Engineering Corporation has removed to that address and will occupy adjacent offices. The services of this department may be engaged through the Fuels Utilization Corporation for consultation, construction or analysis of any combustion or power-plant problems.

B. Freidus & Co., machinery and electric motors, have moved their entire stock of machine tools and office to their new building, 1303 Columbus Avenue, Boston

After Jan. 15, Joseph J. Simon will furnish engineering and sale service in Southern California, with office in Los Angeles, for manufacturers of mechanical products. He is a mechanical engineer, familiar with engineering sales in connection with street railways, power plants, automotive and manufacturing industries.

Thomas G. Watson, formerly general manager and treasurer, John J. Kelleher, Inc., Brooklyn, scrap iron and steel, has resigned to engage in the scrap iron and steel business at Fifteenth Street and Second Avenue, Brooklyn.

The Green Engineering Co., East Chicago, Ind., manufacturer of chain grate stokers, steam jet ash conveyors, cast-iron hoppers and Sealflex ignition arches, has opened a direct branch sales office in suite 941, Monadnock Building, 53 West Jackson Boulevard, Chicago. The former agency representation has been discontinued in the Chicago district. J. W. Himmelsbach has been appointed district manager with supervision over sales in northern Illinois, northern Indiana, Iowa and Michigan. P. Albert Poppenhusen, president, will maintain an office at the Chicago address. The general sales office will remain at the factory.

The Paragon Tool Co., Seattle, has been appointed warehouse distributor for Deluxe lightweight gray iron pistons, covering the Pacific Northwest.

The Meigs-Powell Co., Milwaukee, organized three years ago to manufacture small tools, precision instruments, jigs, dies, etc., has discontinued business and the corporation has been dissolved. The plant at 522-524 Sixteenth Avenue was badly damaged by fire several months ago. John D. Powell was president; Charles Polacheck, vice-president, and Arthur E. Meigs, secretary and treasurer.

The J. W. Paxson Co., foundry machinery and supplies, has occupied its new buildings at Nicetown Avenue and D Street, Philadelphia.

The Acme Fancy Wire Works, Detroit, has changed its name to Acme Wire & Iron Works. When the company started in business in 1899 it made fancy wire products, wire specialties, florist designs, etc., but has since added so largely to its line as to make the new name more appropriate.

The Henry Weis Mfg. Co., Atchison, Kan., steel products, is now being represented in New York by the Philadelphia Fire Retardant Co., 110 West Thirty-fourth Street, telephone Fitzroy 6056. The New York office is in charge of G. S. Nobles, for some years past purchasing agent with the Turner Construction Co., assisted by W. S. Miller, who was superintendent of erection with the Variety Fire Door Co. for more than 15 years.

Reed, Fears & Miller, Inc., room 346 Oliver building, 141 Milk Street, Boston, has moved to the eighth floor of that building, rooms 853-854, into larger quarters.

The Federal Supply Co., East Seventy-ninth Street, Cleveland, has been appointed representative in that territory for the Quigley Furnace Specialties Co., Inc., 26 Cortlandt Street, New York, manufacturer of hytempite and insulbrix.

Stanton L. Driefus, broker in iron and steel, has removed from the West End Trust Building, South Penn Square, Philadelphia, to the Philadelphia Bank Building, 421 Chestnut Street

## Plans of New Companies

The Heipershausen Corporation, 43 Tompkins Street, New York, has recently been incorporated, taking over the business and property of Heipershausen Brothers, who have been in business for many years manufacturing boilers. The two partners have reached respectively the ages of 79 and 73 and have incorporated so as to give stability to the business of which two of their sons are now officers. The president of the company, Phillip Heipershausen, has invented some new departures in land and marine boilers.

The United Automotive Body Co., Danville, Ill., is a new organization incorporated under the laws of Delaware. It is not connected with the Ohio corporation of the same name with offices at Cleveland.

The Pittsburgh Nipple & Mfg. Co. has been reorganized and incorporated and has moved to 411 South Main Street, Pittsburgh, where it will continue to manufacture nipples and all special pipe threading, being equipped with new and a larger number of machines.

## Industrial Finance

Henry W. Waite, president of the Lord Dry Dock Corporation, 105 West Fortieth Street, New York, has been appointed receiver for the company under bond of $50,000. The company operates a ship repair plant at Weehawken, N. J., and was incorporated under Delaware laws in 1920, with capital of $10,000,000. It is said to be solvent but short of liquid assets. Following the receivership appointment, brought about by the action of the Cunard Terminal Corporation with claim of $21,000 against the corporation, a number of other creditors, with claims aggregating over $16,000, have filed a petition in bankruptcy against the company.

The Sizer Forge Co., 238 Larkin Street, Buffalo, has filed notice of increase in capital from $300,000 to $500,000.

The Pneumatic Scale Corporation, Ltd., Quincy, Mass., manufacturer of weighing equipment and devices, has filed notice of increase in capital from $1,500,000 to $2,800,000.

The United States Automotive Corporation, Connersville, Ind., operating the Lexington Motor Co., Ansted Spring & Axle Co., Connersville Foundry Corporation, all of Connersville, and other automotive organizations, has disposed of a bond issue of $1,750,000, the proceeds to be used for financing general operations, etc.

The Strom Steel Ball Co., 621 Harr Place, Oak Park, Chicago, has filed notice of increase in capital from $150,000 to $250,000.

David Strouse, 39 Center Street, New Haven, Conn., has been appointed receiver of the American & British Corporation, with plants at Bridgeport, Conn., and Providence, R. I. The company went into the receiver's hands two years ago.

The Atlantic Shipping Co., Stonington, Conn., is to dissolve. The company was organized in 1908, and during its existence constructed 10 vessels.

The Warren Tool & Forge Co., Youngstown, has increased its capitalization to $1,800,000, and on the basis of appraisal values has absorbed the American Block & Mfg. Co. and the General Malleable Co. properties.

The Noiseless Typewriter Co., Inc., Middletown, Conn., organized as an operating company, has transferred all assets and liabilities to a Delaware corporation of the same name, a holding company, and will shortly file with the secretary of Connecticut a certificate of dissolution. No changes in the personnel of the Middletown plant organization are involved.

A public offering of $1,750,000 United States Automotive Corporation 8 per cent first mortgage convertable bonds, dated Aug. 31, 1921, and due Sept. 1, 1931, part of an authorized issue of $3,000,000, was made last week. The company owns a controlling interest in the Ansted Spring & Axle Co., Connersville Foundry Corporation, and other manufacturing units.

The General Electric Co. offers employees the opportunity to subscribe to 7 per cent debenture 15-year bonds dated Nov. 1, 1921, subscriptions being limited to $1,000 to each person. In addition, $10 bonds sold only for cash and 50c. subscription stamps, both convertible into the larger bonds, are offered. Subscriptions will be received until Jan. 14.

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A shortage of electric current due to a protracted drought in the Alpine regions led to the use for driving machinery in the Fiat works, Turin, Italy, of some 150 of the agricultural tractors the company is building. The rating of each tractor engine is 25 to 35 hp. and the statement is made that the power developed by them all totaled more than 5000 hp., indicating the employment of tractor engines on an unusual scale for temporary power purposes.

# Machinery Markets and News of the Works

## GAIN IN MACHINERY SALES

### January Shows Improvement Over December, Which Was Best Month in 1921

### Delaware, Lackawanna & Western Railroad Places Orders Aggregating About $100,000—Other Important Buying

Evidences of slow but steady improvement in the machine-tool situation multiply. From the Cincinnati district it is reported that the outlook is sufficiently encouraging to bring about the initiation of plans for resumption of work at some machine-tool plants within the next 60 or 90 days.

January business is in fair volume, considering the lean sales figures of the past year. With many sellers December was the best month of 1921, and January seems likely to surpass last month in the volume of orders. Inquiries are unquestionably coming out in greater number, and while the most of them are for single machines or very small lots, there are a number of fair-sized lists before the trade.

Outstanding among purchases of the past week was the placing of orders for about 40 tools by the Delaware, Lackawanna & Western Railroad, the total outlay being about $100,000. Two large New York houses specializing in railroad shop equipment received the bulk of the business. Other railroad buying is inconsequential, but includes a few additional tools acquired by the Seaboard Air Line and purchases of single tools by the Erie Railroad and the Santa Fe. The Third Avenue Railway Co., New York, has bought four tools.

A New England manufacturer of screw machines has received an order for $50,000 worth of tools from a Middle Western automobile manufacturer. The General Motors Corporation has bought six large horizontal boring mills for one of its Detroit plants and a like order has been placed by a manufacturer of automatic brakes.

Detroit automobile plants are preparing for 1922 production schedules, and within the past 30 days have inquired for about $250,000 worth of machine tools. Many of the inquiries are for single machines, but lists up to 25 or 30 tools are being figured on. Actual placing of orders will probably hinge on the automobile buying that develops within the next month or two.

The Western Electric Co., Chicago, has placed a large order for Gisholt special machines; the Hannifin Mfg. Co., Chicago, has bought a small list of miscellaneous equipment; the Board of Education of South Bend, Ind., has bought a list of tools for a vocational training school.

The complete list of the Streets Co., Chicago, consisting of about 40 fabricating machines for steel car work, mentioned briefly last week, is published in this issue under the Chicago heading.

Export business is quiet, but a few orders are being received. A Cincinnati manufacturer of electrical tools has received a large order from Australia, the first of its kind in 16 months, and another good-sized order has been received from Japan.

## New York

NEW YORK, Jan. 17.

The Delaware, Lackawanna & Western Railroad has placed orders for about $100,000 worth of machine-shop equipment, a large part of the business going to two companies which specialize in railroad tools. There has been no other important railroad buying, but the Erie Railroad has ordered a Southwark double-end punch. The Third Avenue Railway Co., New York, has bought four machine tools and other repair shop equipment.

The Johns-Manville Co., New York, which was reported last week as having issued an inquiry for about a dozen tools for its plant at Waukegan, Ill., has added several tools to this list.

A considerable number of planers with special attachments will be required for planing the cast iron segments for the New York-New Jersey vehicular tunnel. Bids for the segments close on Feb. 7 and the successful bidder will undoubtedly purchase the necessary tool equipment.

Demand for used machinery is fairly active. A dealer sold $17,000 worth of tools to a single manufacturer, the purchase including two 7-ft. radial drills, lathes and grinders.

Though December was the best month of 1921 with some machine-tool sellers, it now appears that January sales, in several instances, will show a slight increase over December. Inquiries are slightly more numerous in some lines and there is more of a disposition on the part of buyers to close with a reasonable degree of promptness.

Representatives of crane builders in this district report the past week to have been about as dull as any week last year. Very few new inquiries appeared and practically no sales were reported. Several old inquiries have been postponed until spring or indefinitely. The Driver Harris Co., Harrison, N. J., has postponed until spring, purchase of the 20-ton electric crane for which it inquired last year. The Thomas Crimmins Contracting Co., New York, recently in the market for a locomotive crane has purchased two Bucyrus steam shovels. Both the Lobdell Car Wheel Co., Wilmington, Del., and the American Brake Shoe & Foundry Co., New York, which are among the bidders on the vehicular tunnel to be constructed under the Hudson River, asked for estimates on small cranes a short time ago. The Utah Copper Co., New York, has purchased a 40-ton, 20-ft. 10-in. span electric crane from the Shaw Electric Crane Co. for Magna, Utah. The Barrie Engineering Co., Ltd., 208A St. Nicholas Building, Montreal, Can., has inquired for a 15-ton, 50-ft. boom locomotive crane and five 2-ton electric hoists for coal handling.

The Standard Sanitary Mfg. Co., Bessemer Building, Pittsburgh, has acquired the plant of the Goodyear Tire & Rubber Co., Jackson Avenue and Honeywell Street, Long Island City, consisting of a six-story building, totaling about 63,000 sq. ft. of space, and will be used by the new owner as an Eastern branch plant.

The Knickerbocker Ice Co., 41 East Forty-second Street, New York, has awarded contract to the Turner Construction Co., 242 Madison Avenue, for a new two-story ice-manufacturing plant at 148-50 Elizabeth Street, 50 x 100 ft., estimated to cost about $100,000, including machinery.

M. F. Westergren, Inc., 213 East 144th Street, New York, manufacturer of sheet metal products, has filed plans for a new two-story plant, 28 x 96 ft., on 144th Street.

Motors and other electrical and mechanical equipment will be installed in the new printing plant to be erected by the Board of Directors, Fordham University, Fordham Road, New York, estimated to cost about $250,000. Plans

will be prepared by R. J. Reilly, 477 Fifth Avenue, architect and engineer.

The New York Edison Co., 130 East Fifteenth Street, New York, will take bids soon for the construction of a two-story and basement power house at 122 East Thirteenth Street. Plans are being drawn by William Whitehill, Forty-first Street and Sixth Avenue.

The Lightolier Co., 569 Broadway, New York, manufacturer of electric lighting fixtures, has leased the five-story building at 65-67 Wooster Street for a local plant.

Merkel Brothers, Chichester Avenue, Jamaica, L. I., are having plans prepared for a three-story cold storage and refrigerating plant, 60 x 75 ft., on Chichester Avenue. Louis Allmendinger, 20 Palmetto Street, Brooklyn, is architect.

The Perfect Brick & Hollow Tile Co., 188 Montague Street, Brooklyn, is taking bids for a new one-story plant, 97 x 100 ft., on Grand Street, estimated to cost about $27,000. Silverstein & Infanger, 190 Montague Street, are architects.

The L. H. Motor Car Co. Long Island City, N. Y., has leased a portion of the building at Vernon and Webster avenues, totaling about 5000 sq. ft. of space, for new works.

The State Hospital Commission, Albany, N. Y., has awarded contract to C. J. Burgess, Marcy, N. Y., for a new cold storage plant at the Marcy State Hospital, estimated to cost about $131,000 with equipment.

Fire, Jan 11, destroyed a number of industrial plants at 389-97 Leonard Street and 102-6 Richardson Street, Brooklyn, including the two-story works of the Brooklyn Fireproof Sash & Door Co.; Samuel Solomon, operating a wheelwright shop; Empire Moulding Co., and Samuel Weinstein, manufacturer of sash and doors, with total loss estimated at about $150,000.

The Computing-Tabulating-Recording Co., 50 Broad Street, New York, manufacturer of calculating machines, has acquired the property and business of the Ticketograph Co., 549 West Washington Street, Chicago, manufacturer of machines for computing piece-work rates in factories, and will operate the company as a subsidiary organization.

The Motor Car Parts Corporation, New York, has leased property at 804 Ninth Avenue for local works.

I. Langner, 700 Trinity Avenue, New York, is preparing plans for a two-story automobile service and repair building, 50 x 60 ft., at Broadway and 185th Street, estimated to cost about $90,000. John De Hart, 1031 Fox Street, is architect.

The Ingram Motor Co., New York, care of Joseph Ingram, president, 2 Rector Street, will construct by day labor its new automobile manufacturing plant at Norfolk and Atlantic avenues, Egg Harbor, N. J. It will be two and one-half stories, with power plant, totaling 40 x 200 ft. H. B. Perry, company address, is engineer.

The New Jersey Power & Light Co., Dover, N. J., will acquire the Woodbourne Electric Light, Heat & Power Co., operating in Morris County, and will make extensions and improvements in power plant and system.

L. O. Koven & Brother, 154 Ogden Street Jersey City, N. J., manufacturers of galvanized range boilers, etc., have filed plans for a new one-story factory to cost about $12,000, exclusive of equipment.

The Board of Education, Broadway, Bayonne, N. J., will soon call for bids for a three-story junior high and vocational school, 200 x 300 ft., at Avenue A and Twenty-ninth Street, estimated to cost about $400,000. Donald G. Anderson, 28 East Forty-ninth Street, New York, is architect.

The Board of Education, South Broad Street, Elizabeth, N. J., is taking bids until Jan. 26, for a new junior high school, to include vocational department, at First and Second avenues and Loomis Street. It will be two-stories, 150 x 370 ft., and is estimated to cost about $700,000. C. Godfrey Poggis, 275 Morris Avenue, is architect.

The Lambert Hoisting Engine Co., 117 Poinier Street, Newark, N. J., has taken over the property and business of the W. A. Crook & Brothers Co., manufacturer of kindred products, and will merge the works with its present organization. The name will be changed to that of the purchasing company.

Phineas Jones & Co., 305 Market Street, Newark, manufacturers of automobile bodies, wagons, etc., have awarded contract to the Becker Construction Co., 361 Grove Street, for its one-story plant, 50 x 300 ft., on Hillside Avenue, near Newark, estimated to cost about $300,000, including equipment.

The Board of Education, East Orange, N. J., has authorized the purchase of property at Elmwood Avenue and South Burnett Street, 256 x 701 ft., for the erection of a new junior high school, to include a vocational department. Plans will be placed under way at an early date.

The Board of Education, Newark, is considering a request from Superintendent of Schools Corson for an appropriation of $108,000 for the purchase of equipment for the new Seymour vocational school, now nearing completion.

# Philadelphia

PHILADELPHIA, Jan. 16.

The Jacques Mfg. Co., Smick Street and Green Lane, Philadelphia, manufacturer of automobile bodies, has acquired the two-story factory at Seventh and Rockland streets, totaling about 40,000 sq. ft. for a new plant. Operations will be concentrated at this location. The company has acquired, also, an adjoining tract of land, aggregating 3 acres.

The United States Cooperage Co., Philadelphia, has leased the three-story machine shop at 3103-7 Grays Ferry Road, and will operate at this location. The property is owned by the Lutz Co., machinist, which previously occupied it.

The Fanning-Schuett Engineering Co., 502 Ruscomb Street, Philadelphia, manufacturer of engineering products, has awarded contract to Hollenback, Inc., 1804 Brandywine Street, for a two-story machine shop on property recently acquired at Third and Cayuga streets.

J. M. White, 1116 Olive Street, Philadelphia, operating a wire manufacturing and wire-braiding plant, has acquired adjoining property, 60 x 64 ft., and will use the site for the erection of an addition.

The city purchasing agent, A. Lincoln Acker, room 312, City Hall, Philadelphia, will receive bids until Jan. 23, for conveyor chains and parts, firebrick and other materials.

The Emergency Fleet Corporation, Philadelphia, is asking for bids until Feb. 7, for the purchase of the stiff leg derricks at the Hog Island Shipyard, including 350 5-ton double-mast derricks; 40 5-ton, single-mast; 44 12-ton, single-mast, and derrick operating machinery, including hoists, motors, controllers, etc.

The Board of Education, Scranton, Pa., has selected Edward Langley, architect, Scranton Life Building, to prepare plans for a new central high school addition, to include a vocational department estimated to cost about $175,000. J. H. Williams is president of the board.

Fire, Jan. 13, destroyed a portion of the plant of the Cochrane Corporation, Earnest, Pa., manufacturer of boilers, etc., with loss estimated at about $100,000. Under normal conditions the company gave employment to about 200 operatives.

The Wyoming Valley Water Supply Co., Hazleton, Pa., is planning the construction of an electric light and power house at Hudsondale, Pa., to be operated in connection with its pumping plant.

The Nilco Lamps Works, Inc., St. Marys, Pa., recently organized to manufacture electric lamps, has acquired the local plant of the General Electric Co., as well as the similar factory of this organization at Emporium. Arrangements are being made for immediate operations and both plants will be placed in service. B. G. Erskine is president, and J. C. Wortman, vice-president.

Directors of the Boll Brothers' Mfg. Co., Fourteenth and Howard streets, Harrisburg, Pa., manufacturer of metal beds and springs, have voted to rebuild the plant, recently partially destroyed by fire with loss estimated at about $30,000.

The Board of Education, Harrisburg, Pa., has awarded contract to S. W. Shoemaker & Son, Harrisburg, for the second unit of the new senior co-educational high school, at a cost of $208,630. The structure will include the vocational shops, with machine and electrical shops, automobile and wood-working departments, etc. A bond issue has been arranged for $300,000 to finance the construction and equipment.

Officials of the Reading Machinery Exchange, 437 Washington Street, Reading, Pa., have organized the Reading Machine & Tool Co., to succeed to the present business and expand operations.

A power house will be constructed in connection with the new shop and warehouse to be erected at Franklin and Fourth streets, Williamsport, Pa., by H. A. Moore, 114 Elm Street, Milton, Pa., estimated to cost about $50,000.

Electric motors and other power equipment will be installed in the three-story and basement printing plant to be erected by the Easton Daily Express Co., 26 North Fourth Street, Easton, Pa., estimated to cost about $150,000. A. D. Chidsey, Jr., 341 Northampton Street, is architect.

Fire, Jan. 7, destroyed the plant and equipment of the Standard Slag Co., Sharpsville, Pa., with loss estimated at about $75,000.

The Vulcweld Rubber Co., Pottstown, Pa., will expend about $200,000 for building and equipping its new plant on property recently acquired. The works will consist of a two-story factory, 60 x 260 ft., with power house and garage. Plans are being drawn. E. W. Smith is head.

The Harrisburg Stanley Spring Co., Harrisburg, Pa., has commenced the erection of its new one-story plant, 50 x 100 ft., and expects to have the structure ready for occupancy prior to March 1, for the installation of equipment to manufacture automobile springs. Harry D. Delmotte, Twelfth and Herr streets, is secretary.

The United Ice & Coal Co., Harrisburg, Pa., has acquired property at Seventh and Schuylkill streets, and will use a portion of the site for a new ice-manufacturing plant, with initial daily capacity of 100 tons. Plans have been drawn and it is proposed to have the works ready for service in June. The company is now operating a similar plant at Forster and Cowden streets which will be continued. Mahlon Miller heads the company.

Horace T. Potts & Co., 316 North Third Street, Philadelphia, will not build a foundry at Erie Avenue and D Street, Philadelphia, as recently stated in THE IRON AGE, but a steel warehouse. Work on the latter will begin some time in the near future.

## Buffalo

BUFFALO, Jan. 16.

The Buffalo, Rochester & Pittsburgh Railroad Co., Rochester, N. Y., has tentative plans for a new car and locomotive repair shop in the vicinity of DuBois, Pa., to be one and one-half stories, 135 x 230 ft., and estimated to cost close to $175,000.

The Board of Education, West Genesee Street, Syracuse, N. Y., will soon call for bids for a two-story junior high school, 175 x 250 ft., at Brighton and Midland avenues, to include a vocational department. Gordon Wright, City Bank Building, is architect. E. M. Tooke is president of the board.

Fire, Jan. 9, destroyed the steel car repair shop of the Pennsylvania Railroad Co., Sixth and Wayne streets, Olean, N. Y., 50 x 175 ft., with loss estimated at about $20,000.

The St. Lawrence Transmission Co., Potsdam, N. Y., has been granted permission to build a new power plant at Colton, St. Lawrence County, for service in this section.

The Hornell Repair & Construction Co., Hornell, N. Y., operating the local shops of the Erie Railroad under lease for about two years, has concluded arrangements with the company for the operation of its locomotive and car repair shops at Susquehanna, Pa., under a similar agreement, effective Jan. 15.

The State Hospital Commission, Albany, N. Y., is taking bids until Jan. 25 for the installation of new electrical equipment at the State Hospital, Binghamton. L. F. Pilcher, Capitol Building, Albany, is state architect. L. M. Farrington is secretary of the commission.

A vocational department will be installed in the school to be erected by the Board of Education, Tonawanda, N. Y., to cost about $100,000.

The Franklin Automobile Co., Syracuse, N. Y., will equip a portion of its plant for the manufacture of a four-cylinder, air-cooled motor, automobile, weighing about 1000 lb., and designed to be sold for $1,000. It is proposed to develop an output of 100 cars per day. H. H. Franklin is president.

The service station of the Hall Motor Co., Brayton and West Utica streets, Buffalo, was partially destroyed by fire Dec. 21, with a loss of $50,000. It will be rebuilt at once.

The American Radiator Co., 1807 Elmwood Avenue, Buffalo, will erect an addition to a compressor house, 50 x 80 ft., to cost $8,000.

## Pittsburgh

PITTSBURGH, Jan. 16.

The machine tool trade at present finds chief encouragement from inquiries rather than orders. Dealers and manufacturers' representatives are figuring against a number of inquiries and are hopeful of getting orders before long. One firm recently sold a 5-hp. motor-driven United States heavy floor grinder and a Fay & Egan joiner. Others also are selling individual tools, but there is a dearth of sales of more than one tool to a buyer. Railroad inquiry is lacking and the steel and associated industries are moving slowly. In the crane market much interest centers in the 10-ton, with 5-ton auxiliary which the United Engineering & Foundry Co. is expected to place with one of three companies probably this week. A crane of similar capacity also is wanted by the Ellwood City Forge Co., Ellwood City, Pa. The National Tube Co., is likely to close before long for a 15-ton overhead for its Christy Park works, McKeesport, Pa. The Morgan Engineering Co., Alliance, Ohio, was the successful bidder for 75-span bucket crane for the Diamond Portland Cement Co., Middle Branch, Ohio, the bucket being of 2-cu. yd. capacity and to be furnished by the Blaw-Knox Co., Pittsburgh. The Shepard Electric Crane & Hoist Co., Montour Falls, N. Y., has been awarded a 5-ton ore bridge hoist with a lift of 100-ft. by the Cambria Steel Co., Johnstown, Pa.; a 2-motor, 3-ton hoist for the Edgar Thomson works, and two 2-ton hoists for the Duquesne works of the Carnegie Steel Co. Inquiries for hoists are numerous, the local office of one leading maker having bids out on a total of 125. Bids recently went in against a blooming mill for the Steubenville, Ohio, works of the Wheeling Steel Corporation.

The Standard Sanitary Mfg. Co., Bessemer Building, Pittsburgh, manufacturer of sanitary fixtures, etc., has awarded a contract to the B. A. Groah Construction Co., 847 West North Avenue, for a one-story addition to its plant on Preble Avenue, 115 x 130 ft., to be used as a plating works.

The Oil Well Supply Co., Oil City, Pa., manufacturer of oil well equipment, will build two additions to its plant. One will be equipped with an electric furnace and auxiliary apparatus.

A vocational department will be installed in the new junior high school to be erected by the Board of Education, Oil City, Pa., estimated to cost about $350,000. Plans will be prepared at once.

The Board of Education, Pittsburgh, has filed plans for a new high school at Chartiers and Hulton Avenues, to include a vocational department, estimated to cost about $700,000. A list of equipment has been prepared for the vocational department in the high school on Howard Street, East Pittsburgh.

A one-story and basement repair and service shop, 25 x 40 ft., will be erected by the Mutual Telephone Co., 19-21 East Ninth Street, Erie, Pa., plans for which have been prepared by Cody, Hicks & Davidson, Ariel Building.

Machinery valued at $50,000 was destroyed by fire, Jan. 11, at the Avella mine of the Pittsburgh & Meadowlands Coal Co., Avella, near Washington, Pa. Plans are under way for the immediate replacement.

Freight-handling machinery, etc., will be installed in the new five-story warehouse to be constructed on Maple Avenue, Johnstown, Pa., by the Johnstown Terminal Warehouse Co., now being organized. It will be 130 x 250 ft., and is estimated to cost about $450,000. William Steele & Sons, Sixteenth and Arch streets, Philadelphia, are the architects and engineers.

The Board of Education, Brackenridge, Pa., has acquired property at Natrona Heights, for a new union high school, including vocational department, for Brackenridge and Harrison townships. It is estimated to cost about $300,000.

The Clarion River Power Co., Foxburg, Pa., is completing surveys and will soon prepare plans for its proposed new hydroelectric generating plant on the Clarion River. It is proposed to build two main power plants in the vicinity of Clarion and Foxburg, respectively. The project is estimated to cost close to $2,000,000.

Fire, Dec. 31, destroyed a portion of the plant at Mine No. 1 of the Ellsworth Colliery Co., Ellsworth, Pa., with loss estimated at about $30,000, including equipment. It will be rebuilt.

The Resistant Alloy Casting Co., New Cumberland, W. Va., recently organized, has acquired the local foundry of the Davis Price Co., and will begin immediate operations. An extensive capacity will be developed.

The Chesapeake & Ohio Railroad Co., Baltimore, has tentative plans under way for its new repair shops at Huntington, W. Va.

The Bond Motor Co., Bluefield, W. Va., will break ground at once for a three-story automobile service and repair building estimated to cost close to $50,000. Garry & Sheffy, Bluefield, are architects.

The Board of Education of the Glenville District, Linn, W. Va., is arranging a list of equipment for installation in the vocational department at the new two-story high school at Sand Fork, near Linn. J. A. Radcliffe is president of the board.

The Berkeley Garage Co., West Race Street, Martinsburg, W. Va., M. Doland, head, has awarded contract to the Cox Construction Co., 606 West King Street, for a new three-story automobile service and repair building, 90 x 115 ft., estimated to cost about $50,000.

# New England

BOSTON, Jan. 16.

A manufacturer of automatic screw machines has secured a $50,000 order from a Middle Western maker of automobiles, a Maine paper mill has purchased a new 14 in. x 6 ft. Flather lathe, while a 21-in. upright drill, 15-in. shaper, and a fairly large air compresser, all used equipment, were purchased by local companies and gear cutting equipment by a Boston manufacturer of gears. These sales constitute practically all the business reported the past week. Users of machine tools and dealers are devoting most of their activities to inventories which partially explains the inactivity of the market.

The accumulation of prospective business continues, however, and has assumed proportions to warrant optimism. No large lists have developed, but there has been a noticeable increase in those involving from one to three or four tools, especially from manufacturers in the southern section of this territory. Much encouragement is derived from the fact that inquiries come from a wide range of manufacturers and concern a variety of equipment, generally conceded a sign of a general industrial revival in the making. Opinions as to when prospects in hand will develop vary considerably, but a majority of dealers are inclined to look for a fair resumption of bookings the latter part of this month or early in February. The press market possibly holds more promise than others, but practically all inquiries are for used equipment. Among new inquiries is one for a 10 ft. used shear from the Edes Mfg. Co., Plymouth, Mass., and for a 14-in. x 6 ft. used lathe from the Hopkins Garage, Wilton, N. H.

No changes in prices for machine tools are reported. Some manufacturers of lathes are inclined to tighten up on prices. That is, they are making no changes in new discounts on the lathes, but discounts on the attachments appear to be growing smaller, which pulls down the average discount for the equipment complete.

Contract has been awarded for extensive changes in the foundry of the Union Metallic Cartridge Co., Bridgeport, Conn.

Plans have been revised for a plant, 60 x 116 ft., to be erected by the National Biscuit Co., North Liberty Street, Waterbury, Conn. A can department is included.

The Uxbridge Worsted Co., Uxbridge, Mass., will erect a coal handling plant. Carver, Macomber & West, Boston, are the engineers.

The Mohawk Mfg. Co., Waterbury, Conn., sheet brass goods, will move to 56-66 Hamlin Street, Middletown, Conn., about April 1 where property has been purchased to which a 50 x 50 ft. addition will be built.

The H. L. Judd Co., 42 South Cherry Street, Wallingford, Conn., metal products, has about completed plans for a five-story 80 x 100 ft. addition.

The plant of A. L. Adams, 307 Center Street, Bridgeport, Conn., cloth cutting and binding machinery manufacturer has been purchased by J. J. Musante, and others of Bridgeport, from the A. L. Adams Estate. A company will be organized to operate the works.

The Department of Public Works, Hartford, Conn., plans to remodel its property on Wells Street into a garage and repair shop. Paul Mason is superintendent.

Herchman & Levine, 223 Main Street, Hartford, Conn., are planning the construction of a two-story 85 x 190 ft. garage, service station and repair shop. F. C. Walz, 407 Trumbull Street, Hartford, is architect and bids will be called for shortly.

Julius Reibert, Mountain Road, East Hartford, Conn., has had plans completed for a one-story 55 x 220 ft. brick and concrete garage and repair shop on Park Street.

A vocational department will be installed in the new high school to be erected at Hartford, Conn., at a cost of over $1,000,000. Bids will be taken soon.

Dr. M. H. Davitt, 525 North Main Street, Palmer, Mass., is contemplating the construction of a public garage and service station on North Main Street.

The Windham Mfg. Co., South Windham, Me., is having plans drawn for a hydroelectric generating plant at its textile mills.

The S. H. Wheeler Estate, 1188 Main Street, Bridgeport, Conn., is having revised plans prepared by C. F. Baron, architect, 79 Sage Street, for a three-story brick and reinforced concrete garage, service and repair shop, 100 x 120 ft., at a cost of $100,000.

The American Hardware Corporation, New Britain, Conn., has acquired the factory of the New Britain Machine Co., used during the war for large gun assembling work. The new owner will use the building as an extension.

Bird & Son, Walpole, Mass., manufacturers of roofing, will build a one-story addition, 80 x 220 ft. Charles T. Main, 201 Devonshire Street, Boston, is architect.

The Board of Education, Quincy, Mass., is taking bids for a new three-story high school, with two-story vocational school adjoining, and power house, estimated to cost about $750,000. Cram & Ferguson, 248 Boylston Street, Boston, are architects.

Fire, Jan. 10, destroyed a portion of the plant of the Angier Mills, Ashland, Mass., manufacturer of waterproof paper products, including machinery, transmission apparatus and other equipment, with loss estimated at about $200,000.

The Stanley-Boston Co., Boston, recently organized to represent the Stanley Motor Carriage Co., Newton, Mass., will operate a complete machine and repair works at 620 Commonwealth Avenue, with equipment for handling aluminum body work, engines, parts production, etc. Francis W. Bellows and G. R. McNear head the company.

The United Illuminating Co., New Haven, Conn., has had plans prepared for an addition to its power plant on Grand Avenue, including improvements in the present building. Westcott & Mapes, Inc., New Haven, are architects.

The Southern Berkshire Power & Electric Co., Rockdale, Mass., has work under way on a new hydroelectric power plant., with initial capacity of about 600-hp.

A vocational department will be installed in the new high school to be erected by the Board of Education, Revere, Mass., estimated to cost about $250,000. E. I. Wilson, Beach Street, is architect.

Fire, Jan. 8, destroyed the plant of the Graphite Mines Corporation, Cranston, R. I., with loss estimated at about $100,000, including equipment and stock.

The New England Power Co., Worcester, Mass., has completed plans and will commence the immediate erection of its new hydroelectric generating plant at Whitington, Vt., estimated to cost approximately $1,000,000.

A vocational department will be installed in the new high school to be erected by the School Commission, Westfield, Mass., estimated to cost about $200,000. Preliminary plans are being prepared by M. B. Harding, 33 Elm Street, architect.

# Chicago

CHICAGO, Jan. 16.

While it cannot be said that buying is brisk, it is notable that numerous inquiries which have been hanging fire for some time are now coming to a head and some have already resulted in orders. One prominent dealer reports that if bookings should continue throughout the year at the rate of the first two weeks of 1922, his house would have no complaint to make. Much of the current inquiry is for machines desired to reduce production costs, or to enable the buyer to branch into new lines of manufacture.

The Santa Fe has purchased a 36-in. engine lathe in addition to the tools reported in this column as bought a week ago. Otherwise the local railroads have taken no further action on their lists. The Board of Education, South Bend, Ind., has made additional purchases for a junior high school. The orders include a 24-in. x 24-in. x 6-ft. planer, a 16-in. shaper, a No. 2 universal milling machine and a 16-in. x 10-ft. engine lathe. The Western Electric Co., Chicago, has placed a large order for special purpose machines with the Gisholt Machine Co., Madison, Wis. The Hannifin Mfg. Co., Chicago, recently bought miscellaneous equipment, including a broaching machine, engine lathe and a grinder. The Chicago Bridge & Iron Works has bought a 20-in. crank shaper. The list of the Streets Co., Chicago, mentioned in this column a week ago, was put out primarily to secure prices for estimating the cost of equipping its plant for the manufacture and repair of steel railroad cars. It is improbable that the company will take immediate action on the inquiry, but in view of the active buying of rolling stock by the railroads at the present time, machinery dealers are hopeful that the list will eventually be bought. The list follows in full:

One single end punch 60-in. throat with triple gag socket, 1 x 1 in.

One single end multiple punch with sufficient depth throat and hand operated spacing table and provided with gag sockets, for punching long angles, cover plates, etc., and motor.

One heavy bulldozer and motor, with sufficient capacity to form diaphragms and other parts of heavy car material, capacity approximately 300 tons; 1-in. stroke.

One plate shear and motor, for shearing and squaring plates used in steel car construction, approximately $\frac{5}{8}$ x 144 in.

One 12-ft. x ⅜-in. bending brake and motor, for flanging steel car floor plates, end plates, etc.

One horizontal punch and motor, 15-in. throat, capacity 1 x 1 in.

One heavy-duty punch and shear and motor, capacity 2¼ x 1⅛ in.

One multiple punch and motor, capacity 600 tons.

One 300-ton hydraulic press.

Two overhead electric traveling cranes, 10 tons capacity, 90-ft. span.

One 3-in. single head threading machine and motor.

One bulldozer and motor, face of cross head approximately 16 in. x 70 in., capacity, 390,000 lb.

One heavy duty drill press and motor, for drilling heavy material, capacity approximately 2½-in. to 3-in. hole.

Two single end punches and motors, provided with triple gag sockets, 15-in. throat, capacity 1¼ x 1 in., for punching I-beams, channels, etc.

One 16-in. engine lathe and motor.

One 300-ton car wheel and axle press and motor.

Two double end car axle lathes and motors.

Two 2-in. triple head bolt cutters and motors.

One 2-in. six-spindle nut tapper and motor.

One large blower and motor sufficient to take care of six blacksmith fires.

One 2½-in. upsetting, or forging, machine and motor.

One ¾-in. bolt header and motor.

One 1½-in. bolt header and motor.

Two 200-lb. Bradley helve hammers and motors.

One eye bender and motor, to take stock 1½-in. diameter bent hot around a 2¼-in. mandrel.

Two single head or single spindle drill presses and motors, to drill all sizes of holes up to 2 in. in diamter inclusive.

One 4-spindle drill press and motor to drill all sizes of holes up to 2 in. in diameter inclusive, also suitable for drilling arch bars.

One shaper and motor for handling tools used in steel car work, medium size.

One 1500-lb. steam hammer.

One standard size grindstone and motor.

Two emery wheel stands and motors, suitable for universal grinding.

One double end punch and shear and motor, 24-in. throats to punch 1¼-in. hole in 1-in. material and for shearing long flats and rounds, 2-in. diameter and 6 x 1-in. flats. Shear blades placed lengthwise of machine.

One single end punch and shear and motor, 48-in. throat, to punch 2-in. hole in 1-in. material and for shearing 2½-in. rounds and 8 x 1-in. flat bars. Shear blades placed lengthwise of machine.

One automatic hack saw and motor, to cut all sizes of material up to 7 in. x 8 in.

One 10-ton electric overhead traveling crane with magnet; 50 ft. long center to center of crane rails; for runway over stripping tracks.

One alligator shear for scrap dock, for shearing scrap metal parts, approximately 8 x 1½-in. flats and 3-in. rounds.

No further changes in prices have been announced, except a reduction of about 20 per cent on precision bench lathes by the S. A. Potter Tool & Machine Works, New York.

C. Schultz, 7251 Vernon Avenue, Chicago, has let contract for a one-story machine shop, 50 x 147 ft., at 6916-6918 Cottage Grove Avenue, to cost $14,500.

The Big Four Artificial Ice Co. has had plans prepared by Franz Roy, 7817 South Shore Avenue, Chicago, for a one-story plant, triangular in shape, 134 x 152 x 488 ft., at 1917-1933 North Springfield Avenue, to cost $35,000.

The Cicero Chicago Corrugated Co., 1542 South Fifty-first Court, Cicero, Ill., will reconstruct at once its one-story plant which was destroyed by fire on Jan. 7.

The Grigsby-Grunow-Hinds Co., 1900-1906 West Lake Street, Chicago, recently incorporated with $150,000 capital stock, has leased 10,000 sq. ft. of floor space in the building at the address given and has purchased most of the equipment for the manufacture of electrical devices and automobile accessories. The officers include: President and general manager, B. J. Grigsby; vice-president, O. E. Grigsby; secretary and treasurer, W. C. Grunow; and assistant secretary and treasurer, O. Q. Hinds.

Waldo G. Gernandt of the Bendix Engineering Co., South Bend, Ind., has secured a patent on a high compression motor which, it is said, can be successfully operated by any kind of oil. Plans are under way to organize a company and set up a plant in South Bend to manufacture the motor.

O. P. Chatfield, Escanaba, Mich., is negotiating for the purchase of the old electric light plant at Iron Mountain, which he proposes to remodel into a brass foundry.

The American Foundry & Mfg. Co., Kansas City, Mo., is being organized by Henry H. Akers to manufacture stoves, furnaces, hardware specialties and oil burners and has purchased a site of three acres, lying between Seventeenth Street, Eighteenth Street, Manchester Avenue and the Kansas City Southern Railroad tracks. Contract has been awarded for the erection of the first unit of the plant, 90 x 140 ft., to cost $30,000. Directors of the company include: H. H. Akers, president and general manager; John T. Sullivan, president Kansas City Foundry Co.; Charles J. Klassen and William L. Krenzer, owners of the Central Pattern Works; Dallas Cooley, secretary-treasurer Kansas City Foundry Co.; R. Richter and O. S. Barrows, all of Kansas City.

Davenport, Iowa, is expected to call a special referendum on the proposed issuance of bonds to cover the cost of the erection of a municipal electric light and power plant. Alvord & Swazey, engineers, Chicago, have been retained to make a survey of the possibilities of the project.

The Board of Education, Peoria, Ill., has awarded contract to William M. Allen Sons & Co., 929 Jefferson Building, for an addition to the high school for manual training and vocational work. Dr. George Mitchell is president of the board.

The National Stamping & Electric Co., 424 South Clinton Street, Chicago, has acquired the plant and business of the Lindstrom-Smith Co., 3212-38 West Lake Street, manufacturer of electrical products, with adjoining site. An addition will be built and operations concentrated at this point, to include the manufacture of a combination stove, toaster and electric iron and other appliances.

A vocational department will be installed in the new two-story and basement junior high school to be erected at Clear Lake, Wis., estimated to cost about $100,000. Plans are being prepared by Edwins & Edwins, 911 Northwestern Building, Minneapolis, Minn., architects.

The Great Western Railroad Co., Minneapolis, Minn., has tentative plans under way for new locomotive and car repair shops at Winona, Minn., estimated to cost $200,000, including machinery.

The Board of Education, Shelby, Iowa, has rejected bids for its two-story and basement high school, 120 x 190 ft., to include vocational department, and will call for new bids in the spring. It is estimated to cost about $150,000. John Latenson & Sons, 632 Peters Trust Building, Omaha, Neb., are architects. Roy F. Freeman is secretary of the board.

The Common Council, Naperville, Ill., has plans under way for its municipal electric light and power plant addition to cost about $50,000.

A vocational department will be installed in the two-story and basement high school to be erected at Olivia, Minn., estimated to cost about $160,000. W. L. Alban, Endicott Building, St. Paul, Minn., is architect. George E. Peterson is clerk of the board.

## Baltimore

BALTIMORE, Jan. 16.

The American Concrete Tile & Products Co., 305 Gaither Building, Baltimore, recently organized with a capital of $250,000, has plans under way for new works, estimated to cost about $55,000. The machinery will cost approximately $25,000. Work will commence at an early date. John E. Springer is president, and John W. Ritter, secretary and treasurer.

The Market Mfg. Co., 1021 Cathedral Street, Baltimore, will soon take bids for a machine shop and automobile service works, 50 x 85 ft., estimated to cost about $22,000.

An ice-manufacturing plant will be constructed by the Southern Maryland Co-Operative Creamery Association, Waldorf, Md., recently organized, plans for which are being prepared by J. E. Withnall, architect, Waldorf. James P. Ryan is president.

The Revenue Department, Baltimore, Charles H. Holtzman, collector of the port, will install electric weighing machinery and other equipment, estimated to cost about $100,000, at the new plant of the American Sugar Refining Co., now nearing completion, for Government inspection work. It is announced that the plant will be ready for operation on March 15.

The Yingling Auto & Carriage Works, Lee Street, Hagerstown, Md., has construction in progress on a one-story shop, 50 x 120 ft., at 237-43 Frederick Street. Harry Yingling is head.

The Veterans' Bureau, Washington, Col. Charles R. Forbes, director, will operate a large automobile instruction school at Camp Holabird, Md. The present Government automotive plant at this place will be utilized, with departments for every feature of car and motor truck work,

including parts manufacture, assembling, repairs, etc. It is expected to have accommodations for about 800 students.

The Red Ash Fuel Co., 315 Wyoming Street, Bluefield, W. Va., will install electrically-operated mining machinery, mechanical draft equipment, mine cars and other machinery at its properties at Red Ash, Va., estimated to cost in excess of $150,000. Bids will be asked within a few weeks. D. C. Yates is president and manager.

Fire, Jan. 2, destroyed the mechanical department and equipment at the plant of the Electric City Brick Co., Augusta, Ga., with loss estimated at about $25,000.

The Jarvis Storage Battery Co., 229 South Liberty Street, Winston-Salem, N. C., has awarded a contract to the E. E. Kinnoman Co., Winston-Salem, for a one-story plant, 70 x 100 ft. G. C. Jarvis is president.

The Board of Education, Commercial Building, Charlotte, N. C., will build a new two-story vocational school, estimated to cost about $100,000. The Northeastern Construction Co., Charlotte, is contractor; C. C. Hook, Trust Building, is architect.

The City Council, Danville, Va., is planning for the installation of new machinery at the municipal power plant, including turbine, boilers and auxiliary operating equipment.

The Universal Heater & Mfg. Co., Waynesboro, Pa., C. W. Sexton, president, manufacturer of heating equipment, sheet metal products, etc., will establish a branch plant at 204 North College Street, Charlotte, N. C. Operations will commence at an early date.

The Cullowhee Normal & Industrial School, Cullowhee, N. C., is having plans prepared for a two-story and basement school, 50 x 200 ft., estimated to cost about $100,000. Nelson & Cooper, Commercial Bank Building, Raleigh, N. C., are architects. A. C. Reynolds is president in charge.

The Hackney Brothers' Co., Wilson, N. C., will rebuild its automobile body and wagon plant, recently destroyed by fire with loss estimated at about $350,000. T. J. Hackney is manager.

The State Board of Prison Control, Baltimore, Md., Robert D. Case, secretary, has asked bids for the erection of a workshop at the Maryland House of Correction to cost about $40,000.

Plans are being considered by the city officials, Baltimore, Md., for the establishment of a central machine shop for repair work. Henry G. Perring, City Hall, is chief engineer.

## Cleveland

CLEVELAND, Jan. 16.

The volume of machine-tool business and inquiries shows an improvement over December, but few orders are being placed for more than single machines. There is more activity in the Detroit market where the General Motors Corporation has placed six large horizontal boring mills, and a like number of machines have been purchased by a manufacturer of automatic brakes. A local machinery house reports that during the past 30 days it has received from the Detroit territory, mainly from the automotive industry, inquiries for machine tools aggregating approximately $250,000, ranging from single machines up to one lot of 25 to 30 tools. While these are regarded as live inquiries, no reliable estimate can be made as to how much of the prospective business will be placed. Reports from Detroit indicate that some dealers are offering unusually liberal terms of payment to effect sales. The Toledo Metal Furniture Co., Toledo, Ohio, is inquiring for two punch presses.

The crane market continues quiet. The National Supply Co., Toledo, has an inquiry out for two 5-ton traveling cranes.

The Sterling Brass Co., 4612 St. Clair Avenue, Cleveland, maker of plumbers' brass goods, will erect a new one and two-story plant at 9600 St. Catherines Avenue which will include a foundry and machine shop providing 40,000 sq. ft. of floor space. The company advises that it will purchase about $50,000 worth of machinery, including foundry equipment and brass working machine tools.

The Visible Pump Co., which has been operating a temporary plant at Ft. Wayne, Ind., will locate in Findlay, Ohio, where it will occupy a portion of the former Grant motor car plant. It is expected that operations will begin about Feb. 1. F. B. Rohrer is president and a number of Findlay and Ft. Wayne men are interested.

The Lima, Iron & Brass Foundry Co., Lima, Ohio, has under consideration plans for enlarging its plant and adding a malleable iron foundry. It also has under consideration a proposal to remove its plant to St. Marys, Ohio.

It is reported from Akron, Ohio, that Fred Claus and Fred Meyers, formerly general manager and factory superintendent respectively, of the Cleveland Welding Division of the Hydraulic Pressed Steel Co., are planning to establish a plant in that city to manufacture steel bases for solid automobile tires and detachable and demountable rims for pneumatic tires.

The Pacific Tractor & Machinery Co., Bucyrus, Ohio, has been incorporated as a preliminary step to the formation of its sales organization for marketing a caterpillar type of tractor truck for small tractors, designed by C. A. Henneuse, formerly president Henneuse Tractor Co., Sacramento, Cal. The truck assembly or tractor truck is being made by the Hadfield-Penfield Steel Co., Bucyrus.

Fire recently destroyed the plant of the Canton Rim Co., Louisville, Ohio, causing a loss estimated at $100,000.

## Detroit

DETROIT, Jan. 16.

The Ford Motor Co., Detroit, has awarded contract to Everitt Winters, 742 Book Building, for one-story addition at River Rouge, 68 x 484 ft., with lean-to extension, 60 x 230 ft.

The Willys-Overland Co., Toledo, Ohio, will concentrate operations at the plant of the Wilson Foundry & Machine Co., Pontiac, Mich., a subsidiary, for the manufacture of motors for the Willys-Knight automobiles. The plant will be enlarged and considerable equipment removed from the Willys-Overland works at Elyria, Ohio, for installation. It is expected to adopt the increased operating schedule early in February. The Willys company will utilize two of the buildings of the former Flanders automobile plant at Pontiac for the assembling of Willys-Knight motors, and equipment for this purpose will be provided.

The Board of Education, City Hall, Grand Rapids, Mich., is taking bids until Jan. 30, for the erection of the first unit of its proposed new vocational training school, to be four-story, 100 x 175 ft., and estimated to cost about $275,000. Williamson, Crow & Proctor, 511 Guilbert Building, are architects; W. W. Bradfield, Michigan Trust Building, is mechanical engineer. H. N. Morrill is business manager for the board.

The Champion Ignition Co., Flint, Mich., manufacturer of spark plugs and other ignition equipment, is planning to devote a portion of its plant to the manufacture of speedometers and parts, and complete precision machinery will be provided for this purpose. Albert Champion is president.

The Gagnier Stereotype Co., 525 Howard Street, Detroit, is having plans drawn for the erection of a new one-story foundry, 30 x 100 ft., on McKinstry Street, near Plumer Street, estimated to cost about $60,000. Kasurin Brothers, 512 Empire Building, are the architects. Edmond Gagnier is president.

The Kalamazoo Sanitary Mfg. Co., Factory and Alcott streets, Kalamazoo, Mich., has completed plans for the erection of its proposed plant addition, but work will be held in temporary abeyance. The factory will be two stories, 122 x 400 ft., and is estimated to cost about $200,000, including equipment.

The Oakland Motor Car Co., Pontiac, Mich., has just completed an addition to the motor plant at a cost of approximately $500,000. This addition has added 200,000 ft. of floor space for manufacturing purposes. In all the plants of the Oakland Motor Car Co. there is a total of 1,270,500 sq. ft. of floor space. This area composes the entire floor space of the eight plants of the company at Pontiac and extends over a plot of land of approximately 28 acres.

## Indiana

INDIANAPOLIS, Jan. 16.

The Reliance Foundry Co., Richmond, Ind., is having plans drawn for a new one-story foundry, 85 x 110 ft., estimated to cost $30,000. J. Mueller & Co., Palladium Building, are architects.

The Board of Education, New Castle, Ind., will take bids about Feb. 1, for a two-story high school, 190 x 220 ft., to include a vocational department, estimated to cost $300,000. Herbert Foltz, 843 Lemcke Annex, Indianapolis, is architect. Martin L. Koons is president of the board.

The Terre Haute, Indianapolis & Eastern Traction Co., Indianapolis, has tentative plans under way for an addition to its electric power plant, with installation to include two 30,000 kw. generators and auxiliary operating machinery. The expansion is estimated to cost $4,000,000. The company has commenced the construction of an addition to its plant at Terre Haute, and a 10,000 kw. generating

unit will be installed at this station, with other machinery to bring the expenditure up to about $400,000.

The Peille Co., Richmond, Ind., manufacturer of metal fireproof doors, etc., has awarded contract to the C. C. Heinzemann & Sons Co., Marion, Ind., for a new two-story plant, 250 x 500 ft., estimated to cost in excess of $150,000, including equipment.

The J. H. Kreippe Tin & Sheet Iron Works, 512 West Franklin Street, Indianapolis, is having plans drawn for a one-story building, 35 x 80 ft. Anderson & Stingle, 110 Upper Fourth Street, are architects.

The Board of Works, Hammond, Ind., will call for bids early in the spring for a new electrically-operated pumping plant, estimated to cost about $90,000 with machinery. W. F. Bridge, Rimbach Block, is engineer. A. G. Kinert is city clerk.

The American Car & Foundry Co., Terre Haute, Ind., will build a new one-story power house, 50 x 70 ft.

The Board of Education, Plymouth, Ind., has commissioned Ernest W. Young, 512 Dean Building, South Bend, Ind., architect, to prepare plans for a new two-story junior and senior high school, including vocational department, estimated to cost about $300,000. Jacob Schlosser is president of the board.

The Board of Sanitary Commissioners, City Hall, Indianapolis, has preliminary plans under way for a one-story power house, in connection with a new sewerage disposal plant, with total cost estimated at $300,000. Charles H. Hurd, 1405 Merchants' Bank Building, is engineer.

The D. V. Reedy Elevator Co., Indianapolis manufacturer of passenger elevators, will erect a new plant at 520-522 South New Jersey Street, two-stories, 44 x 202 ft. A steel hoisting crane will be part of the equipment.

The Peerless Metal Products Co., Chicago, manufacturer of metal articles, has leased space at 109 West Tenth Street, Indianapolis, and expects to have it in operation within a month. A. E. Shirley, of Shirley Brothers, Indianapolis, is president of the company; J. A. Spahn, vice-president and Joseph P. Hanley, secretary-treasurer.

## Cincinnati

CINCINNATI, Jan. 16.

There have been few developments in the machinery market the past week. While the number of orders booked has been small, an undercurrent of optimism exists among manufacturers and dealers regarding the immediate future, and it is expected that before the winter is over a larger operation of plants will be seen. Most of the orders booked are for single machines and come from widely scattered points. The Delaware, Lackawanna & Western is understood to have closed on its list of 40 tools. The Seaboard Air Line has bought some tools in addition to the list closed several weeks ago. A local manufacturer reports the receipt of a large order from Australia for small electrical tools. This is the first from this source in 16 months. The same firm also received a substantial order for Japan. General export business, however, is very quiet, although a local manufacturer recently booked an order from France. No new inquiries of consequence have been noted the past week, although a prospect in the immediate future will be the William Powell Co., valve manufacturer, Cincinnati. It has not yet made up its machinery requirements, but is expected to be in the market shortly for miscellaneous machines.

The William Powell Co., Cincinnati, valve manufacturer, has purchased the former plant of the Cincinnati Grinder Co. on Colerain Avenue, and will, after alterations are completed, equip it for the manufacture of iron valves. The present plant will be devoted entirely to the manufacture of brass valves and fittings. The property acquired contains 36,000 sq. ft. of floor space and the purchase also includes a number of cranes now installed for the handling of heavy material. Eventually the directors contemplate building a foundry to manufacture their own castings.

## Seattle

SEATTLE, Jan. 9.

The City Council, McMinnville, Ore., has preliminary plans under way for a hydroelectric generating plant on the Nestucca River. It will consist of two units and is estimated to cost about $250,000.

The Tacoma Ice & Refrigerating Co., South Twenty-sixth Street, Tacoma, Wash., is arranging for the erection of a new five-story ice-manufacturing and refrigerating plant at South Twenty-sixth and Holgate streets, estimated to cost about $250,000, including machinery.

The Pacific Spruce Corporation, Toledo, Ore., will soon begin operations at the former Government lumber mill in this section, recently acquired, and has plans under consideration for an addition, to be equipped as a box factory and general planing mill.

Electric motors and other power equipment will be installed in the three-story printing plant, 100 x 100 ft., to be erected by the Telegram Publishing Co., Washington and Park streets, Portland, Ore. It is estimated to cost about $160,000. Rasmussen & Grace, Chamber of Commerce Building, are architects and engineers.

The Columbia Wood Products Co., Rainier, Ore., recently organized with a capital of $250,000, has acquired a local site for new works, estimated to cost $100,000, with machinery. Plans for the initial unit have been completed.

J. H. Johnson, Tillamook and Hancock streets, Portland, Ore., has made application for permission to build a one-story machine shop and automobile repair works.

## The Central South

ST. LOUIS, Jan. 16.

The Cape Girardeau Portland Cement Co., Cape Girardeau, Mo., will make extensions and improvements in its plant, including the installation of new power equipment, estimated to cost close to $150,000. New grinding machinery and other equipment will be installed in the cement mill. Charles L. Harrison is president.

The Harper Oil & Refining Co., Henryetta, Okla., recently organized, with a capital of $200,000, has concluded negotiations with the Chamber of Commerce for the purchase of 10 acres in the western section of the city for a new refinery, estimated to cost about $100,000. Plans have been prepared and work will commence soon.

The Board of Education, Marshall, Mo., has selected Owen, Payson & Carswell, architects, 505 Interstate Building, Kansas City, Mo., to prepare plans for a new high school, to include vocational department, estimated to cost about $250,000.

The Muskogee Vitrified Brick Co., Muskogee, Okla., has plans under way for a new plant, 60 x 150 ft., to replace its works recently destroyed by fire. It is estimated to cost about $35,000. Frank A. Nicholson is president and manager.

The Nance Mfg. Co., Dederlick Building, Knoxville, Tenn., is considering the establishment of a new factory to manufacture stamped metal products.

The St. Louis & San Francisco Railroad Co., St. Louis, is planning for extensions and improvements in its repair shops at Enid, Okla.

The City Council, Bristol, Tenn., has preliminary plans under way for a municipal hydroelectric generating plant on the Holston River. W. H. Rouse, mayor, is in charge.

The Belknap Hardware & Mfg. Co., Second and Washington streets, Louisville, is completing plans and will soon commence the erection of a building at its works, estimated to cost in excess of $1,000,000. Graham, Anderson, Probst & White, Railway Exchange Building, Chicago, are architects.

The Board of Education, Eighth and Chestnut streets, Louisville, has selected D. X. Murphy & Brothers, architects, Louisville Trust Building, to prepare plans for an addition to the local vocational school, estimated to cost about $50,000. J. N. Bloom is president of the board.

The Knoxville Cement Products Corporation, Knoxville, Tenn., recently organized, has acquired buildings and will install equipment for the manufacture of brick, blocks, tile and kindred products. C. P. Koehn is president and general manager.

Cosden & Co., 120 Broadway, New York, are planning for additions to their oil refinery at Tulsa, Okla., estimated to cost in excess of $1,000,000, including equipment.

The Profit-Sharing Ice Co., Chattanooga, Tenn., will build a new one-story ice-manufacturing plant with capacity of about 50 tons per day. Bowdre Brown is president.

The Common Council, Okeene, Okla., is perfecting plans for enlargement of the municipal electric light and power plant, to include the installation of new equipment, estimated to cost about $40,000. Louis Vogt is mayor.

The Pine Bluff Compress & Warehouse Co., Pine Bluff, Ark., has awarded contract to M. M. Redman, Pine Bluff, for an addition to its plant to cost about $50,000.

The Doe River Sand Co., 208 Main Street, Johnson City, Tenn., is planning for the installation of machinery at its properties on the Doe River, including washing and screening equipment, elevator and hoist, power equipment, cars, etc. The company was incorporated recently. R. N. Campbell is president.

The Missouri & Pacific Railroad Co., St. Louis, has

awarded contract to T. S. Leake & Co., 608 South Dearborn Street, Chicago, for a new engine house and shop at Hoisington, Kan.

The Board of Education, Independence, Kan., is taking new bids on revised plans for a two-story and basement junior high school, with vocational department, 150 x 200 ft., estimated to cost approximately $200,000. N. S. Spencer & Son, 39 West Van Buren Street, Chicago, are architects.

The National Hardwood Co., 618 Bryant Building, Kansas City, Mo., has awarded contract for a new plant, 40 x 160 ft., to include band saw, finishing machinery and other wood-working equipment. J. W. Hoffman is president.

Peers & McGlone, Pine Bluff, Ark., manufacturer of automobile spokes, have had plans prepared for an addition to develop a daily capacity of about 30,000 spokes. Work will commence at once.

The Atoka Public Service Co., Atoka, Okla., is considering plans for a new one-story ice-manufacturing works, estimated to cost about $50,000.

Henry Pilcher's Sons, Louisville, Ky., manufacturers of pipe organs, are in the market for universal swing boring machine, with a radius of 7 ft., the drill head to be equipped with a positive stop and steady enough that it may be used for counter sinking.

## Milwaukee

MILWAUKEE, Jan. 16.

Although neither inquiry nor buying has assumed proportions that ordinarily would give the machine-tool market a tone of activity, a recovery from the low point reached during the holidays has set in. The situation the past week was better than that through December, and is reminiscent of the comparatively active days of October and November. It is confidently believed that from now until spring there will be slow but steady betterment, judging by the scope of requirements already in prospect, but probably not yet apparent on the surface. Boot and shoe industries and makers of textile machinery and equipment are seeking some tools. Automotive industries have not yet resumed buying, but inquiry is increasing due to the good results growing out of the national expositions in the way of distribution of 1922 production. One of the most encouraging features is the return of optimism to the agricultural implement trade, which is expected to develop some new tool requirements within a short time.

The Allis-Chalmers Mfg. Co., Milwaukee, has booked an order for a turbine and generator unit, involving about $250,000, from the Daido Hydro-Electric Co., Nagoya, Japan.

The Bullard Mfg. Co., Madison, Wis., has been incorporated with a capital stock of $25,000 by Earl J. Bullard, Jessie M. Bullard and Lucille E. Brown, to manufacture patented mechanical specialties designed by Mr. Bullard, especially a piston ring. It is intended to establish a plant eventually, although for the present production will be effected under contract. Offices have been established at 219-220 Washington Building.

The Raymond Mfg. Co., Milwaukee, a new $30,000 corporation, organized to manufacture automotive accessories and parts and mechanical specialties, has acquired a site on Richards Street, near the northern city limits, and will build a one-story brick machine shop, 40 x 60 ft., which will require a small complement of machinery, with individual electric motor-drive, served by purchased current. Charles S. Raymond, 77 Cawker Building, is president.

The Hartford Tool & Machine Co., Hartford, Wis., has plans for a new one-story machine shop, 50 x 90 ft., which will be built early in the spring to replace the one destroyed by fire recently. The investment will be about $25,000, including equipment. Fred F. Jordan is proprietor.

M. R. Carpenter, 105 North Clark Street, Chicago, architect and engineer, is preparing plans for an artificial ice plant, 50 x 100 ft., one-story, to be erected at Beloit, Wis., for an unidentified local interest. The cost will be $40,000.

The New-Way Mfg. Co., Eau Claire, Wis., manufacturer of concrete mixers and other building and construction equipment, has decided to move to Chippewa Falls, Wis., where a site has been acquired for a new machine and assembling shop, 50 x 100 ft. The contract for erecting the shop has been let to Tschopp, Durch & Camastral, local contractors. For the present only a small list of additional equipment will be purchased. A. H. Behrens is vice-president and general manager.

The Board of Education, District No. 2, West DePere, Wis., will take bids about Feb. 10 for a new high school and vocational training institute, 76 x 130 and 60 x 135 ft., two stories and basement, designed by Foeller, Schober & Benton, architects, Green Bay, Wis. The cost is estimated at $210,000, including all equipment. James J. Hughes is secretary of the board.

The Board of Education, Eau Claire, Wis., will proceed with the erection of a new high school, to contain manual training and domestic science facilities. Competitive plans are being asked from architects. The appropriation amounts to $500,000. Miss Emma Schroeder is clerk of the board.

The Board of Education, Birchwood, Wis., has let the general contract to Schaefer & Olson, Chippewa Falls, Wis., for a new high school and vocational training institute to cost about $175,000. The architect is Edward Tough, Madison, Wis.

The Farmers Produce Co., Chippewa Falls, Wis., will build a $60,000 addition to its store and warehouse, to be used principally for cold storage purposes. It will be four stories and basement, 30 x 132 ft., and will require an artificial ice producing unit, new boilers, etc. Fred Anderson, 15 West Central Street, is general manager.

## California

SAN FRANCISCO, Jan. 9.

The Durant Motors Co., Oakland, Cal., a subsidiary of Durant Motors, Inc., New York, is awarding a number of sub-contracts for its new two-story plant, at East Fourteenth Street and the city limits, 800 x 800 ft., including four wings. Work is under way. It is estimated to cost about $750,000, including machinery. The P. J. Walker Co., Monadnock Building, San Francisco, has the general contract. H. J. Brunnier, Sharon Building, San Francisco, is engineer.

A. B. Atkinson, head of the Oak Park Lumber Co., Sacramento, Cal., is organizing a company to build and operate an ice and cold storage plant. Plans have been prepared for a building, estimated to cost about $80,000, including machinery.

The American Aluminum-Metal Products Co., Los Angeles, is taking bids through Richard D. King, architect, 519 Van Nuys Building, for its new plant at Burbank. It will consist of seven buildings and is estimated to cost in excess of $100,000.

The Union Ice Co., 354 Pine Street, San Francisco, is completing arrangements for a one-story ice-manufacturing plant at Napa, Cal., estimated to cost about $50,000. W. H. Toepke, 942 Market Street, San Francisco, is architect.

The Washington Iron Works, 1946 Sacramento Street, Los Angeles, has awarded a contract to John F. Kuhns, 810 Fedora Street, for a one-story building, 135 x 161 ft., at Eighth and Mateo streets, estimated to cost about $26,000.

The Industrial Mfg. Co., Lodi, Cal., recently organized with a capital of $200,000, is planning for the establishment of a works to manufacture pumping machinery and parts. Dean H. Thompson and William C. Allen, both of Lodi, head the company.

The George H. Dorrmann Steel Co., Monadnock Building, San Francisco, has leased a building on Adeline Street, Oakland, Cal., totaling about 15,000 sq. ft., for extensions.

The Pacific Fruit Express Co., 65 Market Street, San Francisco, a subsidiary of the Southern Pacific Railroad Co., will commence the immediate erection of a new ice-manufacturing and railroad car precooling plant at Calwa, Cal., estimated to cost about $85,000.

The Merced Irrigation District, Merced, Cal., has commissioned R. C. Starr, engineer of the San Joaquin Light & Power Corporation, Fresno, Cal., to prepare plans for its hydroelectric generating plant on the Merced River, estimated to cost in excess of $1,500,000.

The Westinghouse Electric & Mfg. Co., Los Angeles, is having plans prepared for a six-story, reinforced-concrete distributing building, 170 x 239 ft., at Fifth and San Pedro streets, estimated to cost about $700,000, with equipment, which will include five traveling cranes, eight elevators, trucks and other material-handling and conveying equipment. Noerenberg & Johnson, Los Angeles Railway Building, are architects.

## The Gulf States

BIRMINGHAM, Jan. 16.

The Chickasaw Shipbuilding & Car Co., Mobile, Ala., a subsidiary of the United States Steel Corporation, is arranging to discontinue shipbuilding work and will devote the entire plant to the manufacture of railroad cars. The initial work will be 2000 cars for the Seaboard Air Line.

The Southwestern Gas & Electric Co., Shreveport, La., will install a new generating unit and auxiliary operating equipment. The work is estimated to cost $150,000.

The Valley Tile & Concrete Co., San Benito, Tex., recently organized, has acquired a site and will establish a plant for the manufacture of tile and kindred products. Machinery

will be installed at an early date. G. W. Wilkerson is president.

The Texas Automotive Co., Dallas, Tex., will operate a machine and repair department for heavy work on the third floor of the building now occupied. J. R. Roach is president.

At a special election, Jan. 3, citizens of Vernon, Tex., approved a bond issue of $100,000 for an electric light and power plant.

The Orange Water, Ice & Light Co., Orange, Tex., will commence work immediately on the enlargement of its electric power plant with the installation of new machinery estimated to cost about $50,000.

The City Council, Orlando, Fla., has preliminary plans in preparation for additions and improvements in the municipal electric light and power plant, estimated to cost in excess of $100,000.

The Common Council, Wellington, Tex., has plans nearing completion for the erection of a municipal electric light and power plant to cost about $50,000. Bonds for this amount recently were approved.

The Stacy Co., Dallas, Tex., is considering the purchase of a site for the erection of a new plant for the manufacture of cotton cleaning machinery and parts. The company recently increased its capital to $50,000.

The Osceola Cypress Co., Osceola, Fla., is planning for the purchase of a 10-ton locomotive crane.

A vocational training department will be installed in the new high school to be erected by the Board of Education, Orlando, Fla. Preliminary plans are being prepared.

Crescent City, Fla., is planning for the erection of an addition to the municipal electric power plant. A. B. Harbison is chairman of board of trustees.

The Atchison, Topeka & Santa Fe Railroad is reported to be planning for additions and improvements in its repair shops at Cleburne, Tex.

The Edna Light, Ice & Water Co., Edna, Tex., has plans nearing completion for extensions in its local electric power plant, to include new engine, generator, switchboard and other electrical equipment. Rudolph Linnarts is secretary and manager.

Paris, Tex., is planning for the installation of a complete waterworks plant and system to cost about $1,000,000. It will include an electrically-operated pumping plant and purification works, with capacity of 3,000,000 gal.; water tank and tower with capacity of 4,000,000 gal.; and about 4½ miles of cast iron pipe of various sizes. John B. Hawley, Calton Exchange Building, Fort Worth, Tex., is consulting engineer for the project.

# Canada

TORONTO, Jan. 16.

The machine tool market in this section is slowly reviving after the period of stagnation during the past month. While sales are still confined to one or two tools, buyers are beginning to enter the market in larger numbers. The chief buying, however, is for replacement purposes. Industrial interests which are preparing to establish plants in the Dominion have not advanced far enough with their programs to enable them to enter the market and as a consequence equipment buying is being deferred, but these interests are sending out inquiries and are receiving such data as will enable them to buy when the time comes. The Canadian National Railways is entering the market from time to time with small lists, but has not resumed buying on a large scale. A limited amount of equipment is also going to automobile plants for renewal purposes, and while it is a fact that several large automobile works are underway in Ontario and Quebec they have not entered the market or placed orders for the machinery which will be required. The demand for small tools is making some headway and while consumers are not buying in large quantities, they are entering the market frequently for small lots.

The Town Council, Wiarton, Ont., plans the installation of an electric pump and engine for the waterworks plant to cost $10,000.

J. D. Best, Glencoe, Ont., is in the market for equipment for drilling oil wells.

Gropp Brothers, Penetanguishene, Ont., are in the market for sawmill machinery, boiler, engine, etc.

W. W. Avey, Norwich, Ont., is in the market for equipment for a planing mill, including engine, boiler, etc.

# IRON AND INDUSTRIAL STOCKS

## Values in General Have Improved During the Past Week

Iron and security values in general have improved the past week on a resumption of moderate investment buying. Renewed investment confidence evidently is based on something beyond further increases in idle freight cars, the many price adjustments on manufactured iron, steel and cotton products, the continued lack of commodities buying in volume, the late developments in international affairs, and the other straws that point to the fact that domestic industrial affairs are still in a very mixed and uncertain condition. That something apparently is based on the money market. Time and commercial paper money rates in the East have dropped below the 5 per cent level for the first time in more than four years, and Federal Bank discounts also are lower in the East. All of which means frozen credits are nearing the vanishing point, and idle money is growing more and more a problem with Eastern bankers. Nothing breeds good business more quickly than surplus funds in banks. Sooner or later, the easier money will spread from East to West.

The range of prices on active iron and industrial stocks from Monday of last week to Monday of this week was as follows:

| | | | |
|---|---|---|---|
| Allis-Chal. com.. | 38¼- 39⅝ | Int. Har. com... | 79½- 83 |
| Allis-Chal. pf... | 88 - 90 | Int. Har. pf..... | ... -106 |
| Am. Can com... | 32½- 34½ | Lack. Steel .... | 44⅜- 46¾ |
| Am. Can pf..... | 94¾- 97⅛ | Midvale Steel.... | 28⅝- 30⅝ |
| Am. C. & F. com. | 141 -146 | Nat.-Acme ..... | 10⅜- 11¼ |
| Am. Loco. com.. | 102¼-105¾ | Nat. E. & S. com. | 30⅜- 34⅜ |
| Am. Loco. pf... | 112 -113 | Nova Scotia Stl. | 23½- 24⅝ |
| Am. Rad. com.. | 83½- 84 | Press. Steel com. | 63 - 64 |
| Am. Stl. F. com. | 31⅝- 33 | Ry. S. Spg. com. | 94 - 96¼ |
| Am. Stl. F. pf.. | ... - 96½ | Replogle Steel... | 26¼- 28½ |
| Bald. Loco. com. | 92¾- 96½ | Republic com. . | 51¼- 53¾ |
| Bald. Loco. pf.. | 104 -104½ | Republic pf. .... | ... - 85 |
| Beth. Steel com.. | 51 - 52 | Sloss com. ..... | 36 - 36½ |
| Beth. Stl. Cl. B.. | 55½- 58¼ | Superior Steel... | ... - 26½ |
| Beth. Stl. 8% pf. | 105 -106 | Un. Alloy Steel.. | 25 - 26¼ |
| Chic. Pneu. Tool | 60 - 60¾ | U. S. Pipe com.. | 16⅛- 16⅞ |
| Colo. Fuel ..... | 24 - 25¾ | U. S. Pipe pf.... | 50 - 51 |
| Cruc. Steel com.. | 59⅜- 65 | U. S. Steel com. | 82⅜- 84⅝ |
| Cruc. Steel pf... | 80½- 82 | U. S. Steel pf... | 115 -118 |
| Gen. Elec. ..... | 136 -141 | Vanadium Steel. | 30¼- 31¾ |
| Gt. No. Ore Cert. | 31½- 32 | Va. I. C. & C.... | 86 - 87¾ |
| Gulf States Steel | 44⅞- 51¼ | West'house Elec.. | 49¼- 50¼ |

## Wire Goods Co. Increases Capital

Notification has been made to the Massachusetts commissioner of corporations by the Wire Goods Co., Worcester, Mass., of an increase in the capital stock from $125,000 to $1,000,000, by an issue of 8750 new shares, par $100. Of the new stock, 4836 shares will be issued as a stock dividend.

The increase in capitalization primarily is for the purpose of absorbing the stock capitalization of the Cassidy, Fairbanks Co., Chicago, the Andrews Wire & Iron Works, Rockford, Ill., and the Andrews Wire Works, Ltd., Walford, Ont. Final action on the merger of these three companies with the Wire Goods Co. will be taken this week, upon the return of Reginald Washburn, president Wire Goods Co., from the West. The Washburn interests for some time have been credited with owning a substantial interest in the involved three companies. Present plans call for the operation of the four plants under a Massachusetts charter.

## Industrial Finance

The plant of the Franklin Tractor Co., Greenville, Ohio, in liquidation, will be sold at public auction on Jan. 24, this decision having been come to at a meeting of the creditors of the company. The entire plants will be sold, including buildings and equipment.

The Federal Court, Detroit, has issued an order authorizing the receivers for the Lincoln Motor Corporation, Detroit, manufacturer of automobiles, to offer the plant at Warren and Livernois streets and property of the company at auction on Feb. 4. The court has placed a minimum price of $8,000,000 on the assets.

The Peninsular Milled Screw Co., of Detroit, has increased its capitalization from $35,000 to $400,000.

The H. S. Lee Foundry & Machine Co., of Plymouth, Mich., has increased its capitalization from $50,000 to $100,000.

Altemus & Prindle, steel and iron products, ores and ferroalloys, Grand Central Terminal, New York, have been appointed eastern representatives of the Steel Plate Products Co., Pottstown, Pa.

# Current Metal Prices

**On Small Lots, Delivered from Merchants' Stocks, New York City**

The following quotations are made by New York City warehouses.

As there are many consumers whose requirements are not sufficiently heavy to warrant their placing orders with manufacturers for shipment in carload lots from mills, these prices are given for their convenience.

On a number of articles the base price only is given, it being impossible to name every size.

The wholesale prices at which large lots are sold by manufacturers for direct shipment from mills are given in the market reports appearing in a preceding part of THE IRON AGE under the general heading of "Iron and Steel Markets" and "Non-ferrous Metals."

### Iron and Soft Steel Bars and Shapes

| | Per Lb. |
|---|---|
| Bars: | |
| Refined bars, base price | 2.53c. |
| Swedish bars, base price | 10.00c. |
| Soft steel bars, base price | 2.53c. |
| Hoops, base price | 3.38c. |
| Bands, base price | 3.13c. |
| Beams and channels, angles and tees 3 in. x ¼ in. and larger, base | 2.63c. |
| Channels, angles and tees under 3 in. x ¼ in., base | 2.53c. |

### Merchant Steel

| | Per Lb. |
|---|---|
| Tire, 1½ x ½ in. and larger | 2.50c. |
| (Smooth finish, 1 to 2½ x ¼ in. and larger) | 2.70c. |
| Toe calk, ½ x ⅜ in. and larger | 3.20c. |
| Cold-rolled strip, soft and quarter hard | 6.25c. to 7.25c. |
| Open-hearth spring steel | 3.55c. to 6c. |
| Shafting and Screw Stock: | |
| Rounds | 3.45c. |
| Squares, flats and hex. | 3.95c. |
| Standard cast steel, base price | 12.00c. |
| Extra cast steel | 17.00c. |
| Special cast steel | 22.00c. |

### Tank Plates—Steel

| | |
|---|---|
| ¼ in. and heavier | 2.63c. |

### Sheets

*Blue Annealed*

| | Per Lb. |
|---|---|
| No. 10 | 3.28c. to 3.53c. |
| No. 12 | 3.33c. to 3.58c. |
| No. 14 | 3.38c. to 3.63c. |
| No. 16 | 3.48c. to 3.73c. |

*Box Annealed—Black*

| | Soft Steel C. R., One Pass Per Lb. | Blued Stove Pipe Sheet, Per Lb. |
|---|---|---|
| Nos. 18 to 20 | 3.65c. to 3.80c. | ..... |
| Nos. 22 and 24 | 3.70c. to 3.85c. | 4.10c. |
| No. 26 | 3.75c. to 3.90c. | 4.15c. |
| No. 28 | 3.85c. to 4.00c. | 4.25c. |
| No. 30 | 3.10c. to 4.25c. | ..... |

No. 28 and lighter, 36 in. wide, 10c. higher.

*Galvanized*

| | Per Lb. |
|---|---|
| No. 14 | 3.95c. to 4.10c. |
| No. 16 | 4.10c. to 4.25c. |
| Nos. 18 and 20 | 4.25c. to 4.40c. |
| Nos. 22 and 24 | 4.40c. to 4.55c. |
| No. 26 | 4.55c. to 4.70c. |
| No. 27 | 4.70c. to 4.85c. |
| No. 28 | 4.85c. to 5.00c. |
| No. 30 | 5.35c. to 5.50c. |

No. 28 and lighter, 36 in. wide, 20c. higher.

### Welded Pipe

| *Standard Steel* | Black | Galv. | *Wrought Iron* | Black | Galv. |
|---|---|---|---|---|---|
| ½ in. Butt | —56 | —40 | ¾-in. Butt | —30 | —13 |
| ¾ in. Butt | —61 | —47 | 1½-in. Butt | —32 | —15 |
| 1-3 in. Butt | —63 | —49 | 2-in. Lap | —27 | —10 |
| 3½-6 in. Lap | —60 | —46 | 2½-6-in. Lap | —30 | —15 |
| 7-8 in. Lap | —56 | —34 | 7-12-in. Lap | —23 | — 7 |
| 9-12 in. Lap | —55 | —33 | | | |

### Steel Wire

| Based Price* on No. 9 Gage and Coarser | Per Lb. |
|---|---|
| Bright basic | 3.50c. to 3.75c. |
| Annealed soft | 3.50c. to 3.75c. |
| Galvanized annealed | 4.25c. to 4.50c. |
| Coppered basic | 4.00c. to 4.25c. |
| Tinned soft Bessemer | 5.50c. to 5.75c. |

*Regular extras for lighter gage.

### Brass Sheet, Rod, Tube and Wire

BASE PRICE

| | |
|---|---|
| High brass sheet | 17¼c. to 17½c. |
| High brass wire | 17¼c. to 17½c. |
| Brass rod | 14¾c. to 15 c. |
| Brass tube, brazed | 26 c. to 27½c. |
| Brass tube, seamless | 18½c. to 19 c. |
| Copper tube, seamless | 21¼c. |

### Copper Sheets

Sheet copper, hot rolled, 24 oz., 21½c. per lb. base.

Cold rolled, 14 oz. and heavier, 2c. per lb. advance over hot rolled.

### Tin Plates

| Bright Tin | | Coke—14-20 | | |
|---|---|---|---|---|
| | Grade "AAA" Charcoal 14x20 | Grade "A" Charcoal 14x20 | | Primes | Wasters |
| | | | 80 lb. | $6.05 | $5.80 |
| | | | 90 lb. | 6.15 | 5.90 |
| | | | 100 lb. | 6.25 | 6.00 |
| IC. | $10.00 | $8.50 | IC | 6.40 | 6.15 |
| IX. | 11.25 | 10.00 | IX | 7.40 | 7.15 |
| IXX. | 13.00 | 11.50 | IXX | 8.40 | 8.15 |
| IXXX. | 14.75 | 13.25 | IXXX | 9.40 | 9.15 |
| IXXXX. | 16.25 | 15.00 | IXXXX | 10.40 | 10.15 |

### Terne Plates

8-lb. Coating 14 x 20

| | |
|---|---|
| 100 lb. | $7.00 |
| IC | 7.25 |
| IX | 7.50 |
| Fire door stock | 10.00 |

### Tin

| | |
|---|---|
| Straits, pig | 35c. |
| Bar | 40c. to 45c. |

### Copper

| | |
|---|---|
| Lake ingot | 16 c. |
| Electrolytic | 15¾c. |
| Casting | 15¼c. |

### Spelter and Sheet Zinc

| | |
|---|---|
| Western spelter | 6½c. to 7c. |
| Sheet zinc, No. 9 base, casks | 10½c. open 11c. |

### Lead and Solder*

| | |
|---|---|
| American pig lead | 5¾c. to 6¼c. |
| Bar lead | 6¾c. to 7 c. |
| Solder, ½ and ½ guaranteed | 27c. |
| No. 1 solder | 25c. |
| Refined solder | 21c. |

*Prices of solder indicated by private brand vary according to composition.

### Babbitt Metal

| | |
|---|---|
| Best grade, per lb | 80c. |
| Commercial grade, per lb | 40c. |
| Grade D, per lb | 35c. |

### Antimony

| | |
|---|---|
| Asiatic | 6½c. to 6¾c. |

### Aluminum

| | |
|---|---|
| No. 1 aluminum (guaranteed over 99 per cent pure), in ingots for remelting, per lb. | 26c. to 28c. |

### Old Metals

The market is quiet with a strong undertone. Dealers' buying prices are nominally as follows:

| | Cents Per Lb. |
|---|---|
| Copper, heavy crucible | 11.25 |
| Copper, heavy wire | 10.75 |
| Copper, light and bottoms | 8.25 |
| Brass, heavy | 5.50 |
| Brass, light | 4.50 |
| Heavy machine composition | 8.00 |
| No. 1 yellow brass turnings | 5.50 |
| No. 1 red brass or composition turnings | 7.25 |
| Lead, heavy | 3.75 |
| Lead, tea | 2.50 |
| Zinc | 2.50 |